BOARDWATCH MAGAZINE

ELECTRONIC BBS AND ON-LINE INFORMATION SERVICES
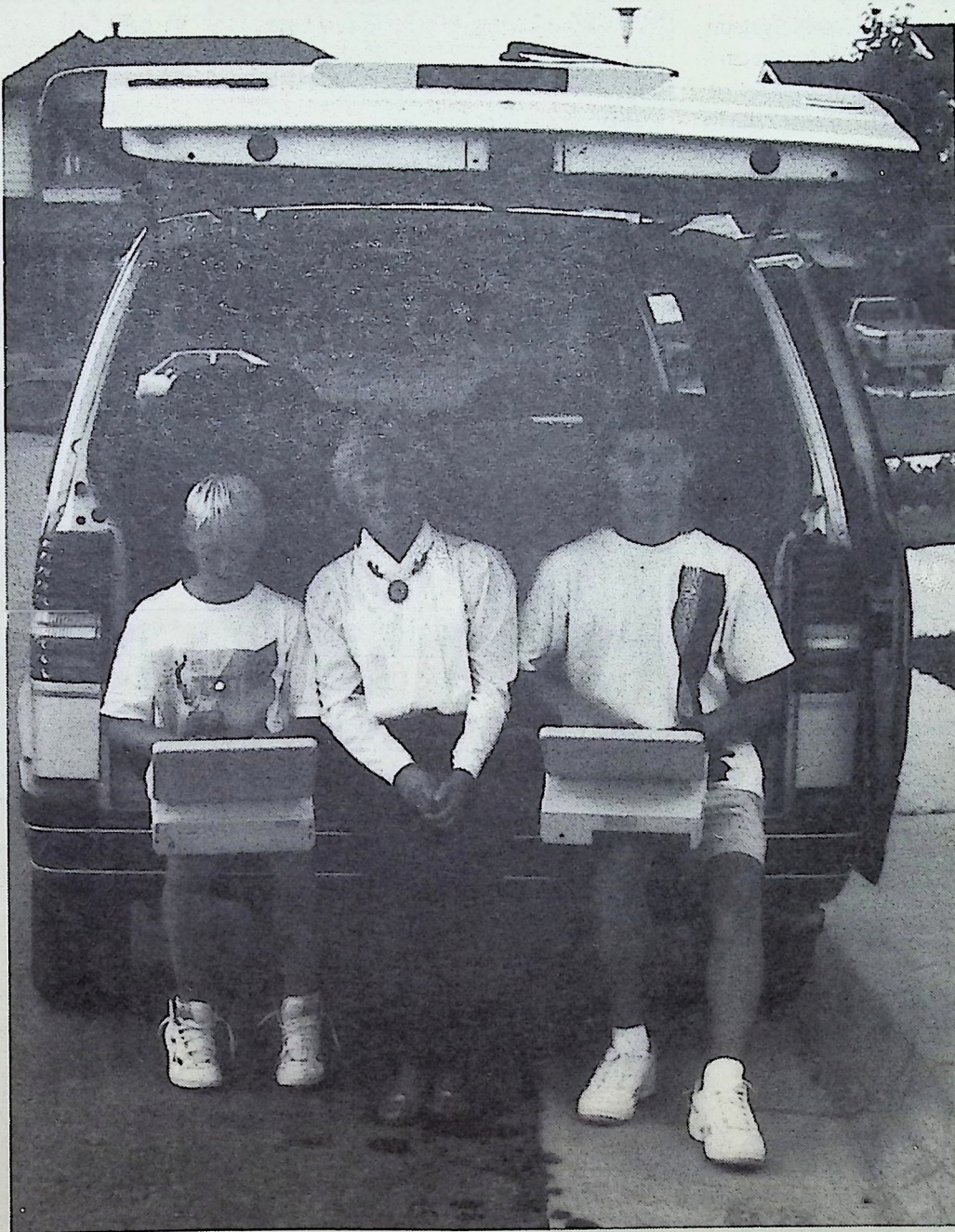
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TELEBITS

BINKLEYTERM-SEADOG ACCORD REACHED

A brewing imbroglio between various vendors of mailer software used by most amateur BBS mail networks, including the international Fidonet, was avoided early in October as the proponents of two competing mailer programs reached an historic agreement to share information on the **SEAlink** file transfer protocol.

For nearly a year, BBS system operators had reported subtle but vigorously annoying difficulties in passing files and echomail between systems using the SEAdog mail program developed by System Enhancement Associates of Wayne New Jersey and the **Binkley-Term** program developed by Bit Bucket Software Co. of Nashua New Hampshire. It is estimated that over 90% of the International Fidonet BBS systems use one or the other of these two programs with **BinkleyTerm**, a free shareware program comprising the vast majority of those systems. **SEAdog**, a $99 commercial program, served many of the larger multiline TBBS-based systems and had been in use for several years.

Normally, the two mailer programs pass files using what is known as a **BARK** request and the **SEAlink** file transfer protocol. Two basic problems arose in passing files between the two programs when using high-speed modems such as the US Robotics HST 9600 and 14,400 models. In passing files from a SEAdog system to a BinkleyTerm system, the BinkleyTerm would respond with a Negative AcKnowledge (NAK) character repeatedly to the very first block of the file sent. After about ten tries, the systems would give up and disconnect the call but the calling party was still billed by the telephone company despite the fact that the transfer had failed.

The second problem involved file transfers from BinkleyTerm systems to SEAdog systems. The entire transfer would proceed normally until the final block of the file. The SEAdog system would never detect the End Of Text (EOT) character ostensibly sent by BinkleyTerm to end the transfer. Although the file would be intact and on-board, SEAdog assumes it failed and deletes the file from the drive. The BinkleyTerm shows the file as successfully sent, while SEAdog recorded it as a failure. Telephone charges could be quite large since the entire file was transferred before the failure. Worse, operators would get into disagreements as to whether the file was ever sent.

The actual causes for these communication difficulties were probably due to some rather subtle timing incompatibilities that the authors of both programs wrestled with for many months with mixed success. BBS system operators, incurring increasing expenses and network difficulties were growing increasingly aggressive in complaints to both companies. The matter was brought to a head when a Fidonet sysop filed a policy complaint with Fidonet authorities over his inability to get mail from another system. Everyone seemed to have a bit different view of "whose fault it was" while in truth, the technical vagaries of advanced protocols preclude such easy answers and authors of both programs, when pressed, admitted they were not sure precisely what caused the problems. Additionally, communications between the two companies was somewhat less than noteworthy.

Unable to "reverse engineer" a solution from the scant information available on the SEAlink protocol, the BinkleyTerm team of Vince Perriello, Bob Hartman, and Alan Applegate announced during the first week in October their intention to drop support for SEAlink in an **October 12 release of BinkleyTerm Version 2.40**. This would have the effect of forcing BinkleyTerm and SEAdog transfers to use the Fidonet Technical Standard (FTS) 001 communications method. While this would cure the problem, it essentially meant dropping back to a now archaic **XMODEM** file transfer algorithm which slows down transfers markedly. A 9600 bps transfer would effectively be forced back to an effective transfer rate of perhaps **2500 bps**. This is somewhat akin to cleaning baby's bottom with Comet Cleanser and a wire brush - very effective, but a bit shy of an ideal solution and likely to cause problems later on.

Thom Henderson, of System Enhancement Associates, is currently releasing a maintenance update to SEAdog in an attempt to address some of the problems. The new version **4.51B** should be available by the time yo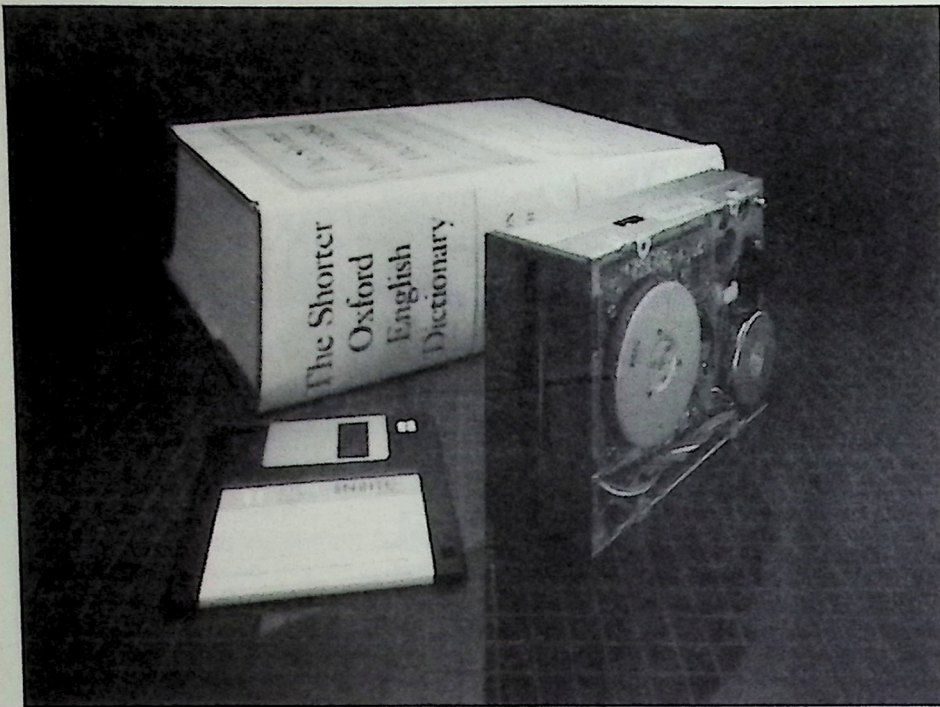u read this. Existing SEAdog users can obtain this update by mailing in their original SEAdog diskette, a self-addressed mailing label, and $1 to cover postage. According to Henderson, this should cure "most" of the problems between SEAdog 4.51 and **BinkleyTerm 2.30**.

But neither solution fully addresses the lingering difficulty in engineering protocols in mail software. This is complicated by a host of both technical and economic issues that are very real to the parties involved and for which there simply are no easy answers. Given the growing number of mailer protocols, coupled with the use of ever higher modem speeds, and ever more exotic protocol algorithms, writing a program to efficiently communicate with someone else's proprietary protocol becomes virtually an impossible task. And universal communications capability is not only desireable in communications software, it is crucial. At the same time, most authors are understandably reluctant to release the source code to a program that may have taken years to develop.

Fortunately, in this particular case the parties involved all appear to have recognized the impact on the community as a whole and taken some fairly dramatic steps to not only address the current problem, but in a sense to set a model for the future. In an unusual move, Thom Henderson provided source code for the SEAdog mailer program to an unnamed third party who volunteered to develop some general state-table documentation on the SEAlink protocol and SEAdog session negotiation. In theory any author will be able to use this forthcoming specification to develop a SEAlink/BARK implementation in any programming language.

And the BinkleyTerm team, who had already publicly announced the October 12 release date of BinkleyTerm 2.40 and who in reality "owns" the lion's share of the Fidonet market, recalled their beta test copies and committed to support the SEAlink protocol in Binkley in all future versions - an awkward and perhaps expensive change in direction for a relatively young software company such as Bit Bucket Software - and based on an as yet unseen specification.

Chris Irwin, author of the commercial D'Bridge software, and Joaquim Homrighausen, author of Front Door, took a more neutral stance on the issue but also agreed to support SEAlink in future

ly scribed into the disk media with a laser. Infrared sensing is used to "correct" head alignment dynamically by following the burned-in servo track. In this way, precise head alignment is possible and so the much narrower data tracks.
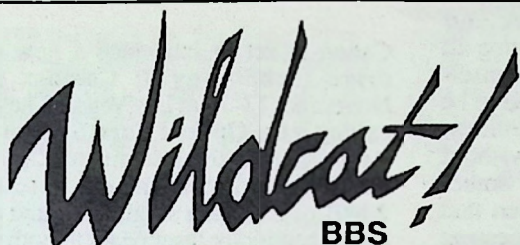
The unit uses a standard Small Computer Systems Interface (SCSI - pronounced "scuzzy") and features an average seek time of **65 ms**. It will mount in a normal 5 1/4 form factor drive bay and external cases are available as well. The specially prepared diskettes are a pricey **$19** each and the drive unit itself is **$699**. This unit would be an excellent way to backup small hard disk drives and still have the facility of an ordinary **3.5**-inch floppy disk drive. microtronics Trade Service, Bettendorfer Str. 36, 5173 Siersdorf, West Germany; Telephone 49-2464-2147.

BUY/SELL STOCKS ON GENIE

Charles Schwab discount brokerage has made it's first online venture a bold one with a new service on General Electric's **GEnie** service. Callers can access the Schwab area to buy or sell securities at discounted brokerage fee rates. A simple Schwab brokerage account agreement must be completed and returned by US Mail but there are no online surcharges to access the Schwab area. **GEnie** has long offered stock quotes online with the required fifteen-minute delay. Now you can check prices and order stock buys/sells on the service. What does **GEnie** stand for? General Electric network for information exchange. You may sign up online by dialing (800)638-8369 data or (800)638-9636 voice.

ONLINE DATABASE OF 55,000 COMPUTER PRODUCT VENDORS

Ziff Davis has released a massive "Rolodex" containing vendor information on some **55,000** computer hardware and software products titled **The Computer Directory**. The service is available online via the CompuServe service or PC Magazine's **PC MAG-NET** online service. Enter **GO COMPLIB** at any prompt to access the service. Ziff Davis Publishing Co., One Park Ave., New York, NY 10016; (212)503-3500.

20.8 MB FLOPTICAL DRIVE

releases "once the specification was completed and signed off by both Henderson and the Fidonet Technical Standards Committee."

squabbles in Fidonet have become so common that many poignantly refer to it as the "International Fight-O-Net". The death of Fidonet has been knelled so many times by so many pundits that its very survival is widely considered a mystery. To outside observers, the sometimes rabid infighting over what often amount to scant pennies is both humorous and alarming.

Against that backdrop, it is encouraging to find gentlemen in Fidonet who face very real and very substantial economic and technical issues, but can still find a creative way to meet on some common ground to the greater good of such a community. It is no small task in itself to try to eek a living from such niche products in the software world and we feel obligated to point out that neither Henderson nor the BinkleyTerm team derives a significant portion of their income from the Fidonet market. We applaud the notable, and in some sense heroic efforts of Vince Perriello, Bob Hartman, Alan Applegate, and Thom Henderson to rise above their personal interests and view the landscape from a

higher vantage point. We would offer it as a model worthy of emulation by the Fidonet as a whole.

SEAdog 4.51B, System Enhancement Associates, 21 New Street, Wayne, NJ 07470; (201)473-5153 voice; (201)473-1991 data.

BinkleyTerm 2.30, Bit Bucket Software, Co., 427-3 Amherst St., Suite 232, Nashua, NH 03063.

20.8 MB 3.5-INCH FLOPPY DISK DRIVE

micronics Trade Service of Siersdorf West Germany appears to be the first to bring the **Insite Peripherals Floptical drive** technology to market with their new **TESS I 325** drive system. Recall from earlier Boardwatch issues that Insite Peripherals had developed a drive unit using ordinary **3.5**-inch floppy diskette media specially prepared with an optical guide track in it to provide **20.8 MB** of storage on a removable floppy diskette. It's also able to read, write, and format standard 3.5-inch diskettes in the more mundane **720 KB** and **1.44 MB** capacities.

To gain the added capacity, the **TESS I 325** stores data at a cramped 1250 tracks per inch. A special servo track is actual-

HIGHER SPEED MODEMS FOR COMMERCIAL SERVICES

CompuServe Information Service has added 2400 bps nodes to 50 cities in the United States bringing the total number of locations supporting the higher-speed modems to about 275. Not only is this number substantially higher than any other commercial service, but CompuServe prices the 1200 bps and 2400 bps services identically at $12.50 per hour. Most competitors charge a higher rate for 2400 bps access than for 1200 bps under the theory that individuals can access more data at the higher speed and therefore should pay more.

Telenet is also quietly bringing the Microcom V.32 9600 bps modems on-line for their packet data switching network. They started installing the units in Washington D.C. in October and will continue in a variety of cities through next year.

CompuServe Information Service, 5000 Arlington Center Blvd., Columbus, OH 43220; (614)457-8600.

COMMUNICATIONS WEEK FAXBACK SERVICE

CommunicationsWeek Magazine is offering a new service where readers can telephone a toll-free (800)733-9335 number and enter a specific advertisers numeric code. The service will then FAX you information on that advertiser. One advertiser supporting this is Microcom. To obtain information on Microcom, simply dial the number and enter code 203 for their literature along with your fax number. CMP Publications, Inc., 600 Community Drive, Manhasset, NY 11030; (516)365-4600.

POSTSCRIPT CARTRIDGE FOR HP LASERJET

Pacific Data Products has introduced a plug-in cartridge for the Hewlett Packard HP Laserjet Series II printer that provides full PostScript compatibility. PostScript is a versatile page description language developed by Phoenix Technologies to print a variety of typefaces and graphics on many high-end laser products. It has become the standard in laser printer interfaces.

The Pacific Data cartridge is titled PacificPage and plugs into either expansion port of the LaserJet Series II printer. The cartridge requires 2 MB of printer RAM to operate and offers all 35 Apple LaserWriter NT printer font families in unlimited point sizes. The cartridge actually uses Phoenix Technologies PhoenixPage Postscript Interpreter Emulation and provides full compatibility with Postscript Version 47.

The cartridge is priced at $695 and works ONLY on HP Laserjet Series II printers - it does not support other laser printers based on the Canon laser printer engine. By plugging in this cartridge, you can take advantage of the much wider selection of fonts and type sizes offered by the Postscript output options provided by desktop publishing applications such as Ventura Publisher, Aldus PageMaker, Word Perfect 5.0, and Microsoft Word 5.0.

Phoenix Technologies, faced with a challenge from Apple Computer and Microsoft who were teaming up to produce a competing interpreter, has quickly released the specification for PostScript to essentially place it in public use. It had been a licensed language with steep license fees. This has led to a fairly precipitous drop in the

price of Phoenix Technologies stock recently since the company essentially produces only the PostScript product. This should lead to a fairly dramatic price drop in PostScript laser printers. Pacific Data Products, 6404 Nancy Ridge Road, San Diego, CA 92121; (619)552-0880.

MIRRORING AND CACHING CONTROLLERS

Distributed Processing Technology has developed two hard disk controller systems that should be of intense interest to information service operators. They address two basic technical problems - data security and access time.

One of the little elements system operators are always wrestling with is how many callers they can support on a single computer without causing individual callers to notice a slowdown in the system. Even large companies like CompuServe and Prodigy wrestle with that one. Microcomputer processing speed has gone up from **4.77 MHz** a few years ago to **33 MHz** on fast **80386** machines and those machines are inherently more efficient. The result is that it is not unusual for today's machines to execute most operations **30** or even **40** times as fast. During the same period, disk drive access times have fallen from **85 ms** to perhaps **22 ms** for a reasonably fast drive today and **16 ms** is considered outstanding. So disk drive speeds have increased by a factor of five or less.

The result is that in most systems disk drive access is the big bottleneck. DPT has come out with a caching disk controller subsystem they claim reduces this access time to an average of **0.5 ms** a - considerable improvement. The **PM 3011/50** controller card handles ordinary **ST506** disk drives, the **PM 3011/60** is available for **Run Length Limited (RLL)** drives, and the **PM 3011/70** can handle **ESDI** drives. Although the basic configuration comes with 1/2 MB of caching RAM, configurations are available to handle up to **16 MB**. The device uses a Motorola **68000** microprocessor. The basic controller with 1/2 MB of RAM lists for **$1150** and quickly climbs toward the **$7500** mark with a full load of RAM.

The other little item that constantly plagues operators is disk backup. With several hundreds or thousands of callers dialing into your system, downtime is

considered an enormous faux pas. Before we had the infamous and dreaded "Computer Virus" to blame all system failures on, hard drives themselves were generally acknowledged to be notoriously undependable devices. Suddenly, and usually quite without warning, you would receive a somewhat terse message on the screen that the disk drive 16 callers were accessing just a minute ago could no longer be found. The disk drive unit had essentially gone brain-dead or had a head crash. Since most drives carried a year warranty and since few of them actually seemed inclined to survive a year, this usually caused a painful if not really expensive disk drive-ectomy.

If you had backed up your entire disk drive system to tape about ten minutes previous to the failure, you simply replaced the disk drive and restored from tape. Very little was lost. The longer the period between backup and failure, the more messages, files, and so forth would be missing when your callers did finally get back in. And in every crowd, there are always a couple of operators who think they lead charmed lives. They play a game called hard disk roulette. And the rules of the game are NO TAPE BACKUPS. Not a pretty sight to see one after a crash. They usually join the ranks of the homeless, wandering the streets and drinking very cheap port.

DPT has developed a disk "mirroring" system that creates redundant data on TWO hard disk drives. They call it the **SmartCache Disk Mirroring Module** and it does require the **PM 3011** caching controller to operate. Anything written to one drive, will also be written to the other. The system operates at the hardware level and is quite transparent to any operating system software. If one of the drives starts throwing pieces of disk platter material out the front of the chassis, the system simply gets its data from the other "backup" drive. A buzzer will alert you that you do have a drive problem. Your callers will never know the difference.

The mirroring module adds about $800 to the cost of the already pricey $1150 PM 3011 caching controller. But for under $2000, you can significantly enhance the speed of your system and have a nearly bullet proof system as well. Distributed Processing Technology, 132 Candace Drive, Maitland, FL 32751; (407)830-5522.

CANON CREDIT CARD DRIVE

Canon is set to introduce a new disk drive technology at **Comdex** this November 13-17 in Las Vegas. They are calling it the **Optical Card System** and it resembles nothing so much as a credit card. The read/write unit can store up to **2 MB** of data on a single card and uses a semiconductor laser beam to both read and write to an optical recording layer on the card. The other side of the card can sport a photo, logo, or other graphic elements. Aside from being smaller in size, the new media doesn't "spin" like the more conventional floppy diskettes and can easily be carried in your pocket. It is virtually impervious to damage.

WATSON COMMUNICATION CENTER

Natural MicroSystems Corp. has done quite well with a digital automated telephone answering device that works from an IBM compatible plug-in circuit card. The device, termed **WATSON** we presume after Alexander Graham Bell's erstwhile assistant, is quite programmable allowing you to setup what must be described as an audio bulletin board system with options and menus accessible from any touch tone telephone. In actual practice, these devices are incredibly tedious to use when overdone with, as is often the case, far too many options. But the Watson device has been well received mainly because of some absolutely superb voice quality. It sounds better than any tape-based answering machine on the market.

In an attempt to woo the home office crowd, Natural Microsystems has put together a pretty stunning bevy of hardware and software they are calling the **Watson Communications Center**. It does include their **Watson Voice Information System** circuit card with a **2400 bps** modem onboard to act as both a voice answering machine and modem. It also includes the **JT Fax 9600** facsimile card to transmit and receive files and **Diamond Flower** half-page hand scanner to scan in hardcopy to fax. **PC Paintbrush** software is included to allow you to touch up/edit graphics images before faxing them. Finally, the **Watson Communications Center** software ties it all together. Using the package, you can receive incoming voice, modem, or facsimile transmissions and have them routed to the appropriate device. And of course, you can dial out fax or modem as well.

The $1499 list price for this five-gallon bucket of gadgets and doodads seems just a bit proud if you add up the going prices for each piece. But if a street price under $1000 ever comes to pass, this should be a very popular combination for the home office crowd. Natural Microsystems Corp., 8 Erie Drive, Natick, MA 01760; (508)650-1300 voice; (800)-6-WATSON for live demo of the Watson VIS.

ZENITH TURBOSPORT 386 LAPTOP DISCOUNTED

Damark Sales Corporation has purchased thousands of Zenith's **Turbos-Port 386** laptop computers at "fire-sale" prices and is offering them at a mail-order price of **$2995** - a full **$5000** under the machines list price of **$7995**. The unit features a **12 MHz 80386** microprocessor, **2 MB of RAM**, a **40 MB** hard disk drive, and a built-in **2400 bps** modem. This is one of the heavier laptops weighing in at a portly **18** pounds. The heavy weight and relatively slow processor speed has made this a slow mover in Zenith's line and they apparently decided to dump some overstock on Damark, a distress inventory reseller. But buyers may find the 80386-based laptop considerably more attractive at **$3000** than at **$8000**. Damark, 6707 Shingle Creek Parkway, Minneapolis, MN 55430; (800)729-9000.

SAFEWAY HAS APPLES FOR TEACHERS

by David Hakala

The Rocky Mountain Division of the Safeway supermarket chain is giving Apple computers, software and peripherals to schools in Colorado, Kansas, Nebraska, New Mexico, South Dakota and Wyoming. Schools collect Safeway shoppers' receipts and "cash in" for any of several systems.

A school must be accredited for grades **K** through **12** to qualify. An **Apple IIc+** monochrome one-drive computer costs **$70,000** in receipts; a **IIc+** color system, **$85,000**; a **IIe** color system or a one-drive **Mac Plus**, **$125,000**; and a **IIGS** goes for **$160,000** in Safeway receipts. Printers and extra floppy drives are also available. Forty educational software titles cost from **$3,800** to **$9,500** in receipts.

The giveaway program will run through **April 27, 1990**. Schools may contact Vicki Myhren, Coordinator of the Apples to Students program, at Safeway's Division Office: c/o Public Affairs, 3888 E. Mexico Ave., Denver CO 80210. Voice: (303)759-7600.

NEW 2.88 MB 3.5-INCH FLOPPY

Practical Computer Technologies has announced plans to begin shipments of a new floppy system based on a **TEAC** extra high density floppy drive unit. They are calling the new drive a **PRAC-TIDISK EXD**. The new floppy system features a formatted capacity of **2.88 MB** in addition to the more common **720 KB** and **1.44 MB** sizes available in current 3.5-inch drives. The unit can read and write the lower densities but to take advantage of the **2.88 MB** capacity requires the use of an extra high density floppy media termed **EXD** that initially may be a bit rare and certainly a bit proud at **$6** or better per diskette. The Practical Computer disk drive controller that comes with the drive provides for a 1 MB-per-second data transfer rate - considerably higher than current floppies offer. The package will retail for **$499**. Practical Computer Technologies, Inc. 3972 Walnut Street, Fairfax, VA 22030; (703)385-3332.

NINTENDO LINKS TO STOCK EXCHANGES

by David Hakala

Having neatly conquered the computer-based games industry, Nintendo Company Ltd. is preparing to unleash its Teenage Mutant Ninja Turtles on Wall Street. Fidelity Investments and Nintendo announced plans for a home stock-trading system based on the Nintendo Entertainment System.

Due out in late 1990, the program will link investors to Fidelity Brokerage Services, the nation's second-largest discount brokerage house, via the estimated **20 million** Ninentedo systems in American households. About **$200** will buy the necessary program cartridge, modem and small keyboard needed to play the market when they tire of playing Rad Racer, according to Jerry Ruttenbur, VP with Nintendo America Inc.

Ruttenbur claims small investors will be attracted by the ease of trading securities through the Nintendo system versus conventional computer software. "The commands will be very simple. We think there is a very big advantage to keeping things simple." Given the simplicity of today's financial markets, perhaps the simplest and most profitable trading program should have just two commands: "Heads -- buy. Tails -- sell."
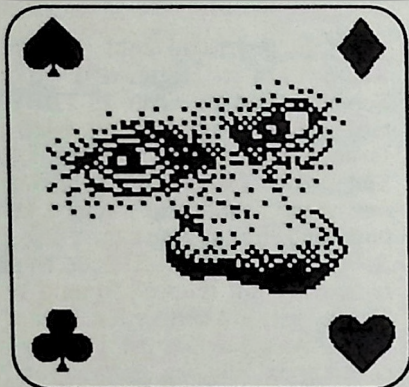
TBBS SYMPOSIUM

eSoft Incorporated held their TBBS Symposium in Englewood Colorado September 14-16. Over 75 TBBS system operators attended the $450 conference from all across the United States and Canada with one operator of one of the Netherland's largest 16-line bulletin board systems traveling from Roermond Netherlands. Joop Mellaart is actually not referred to as a sysop. He's a **Netwerkbeheerder**. Rumor has it that sysops across the U.S. are also considering retitling themselves Netwerkbeheerders as well.

The Netwerkbeheerders at this conference were all ears as Phil Becker, President of eSoft and author of the popular TBBS bulletin board software detailed use of their new **TDBS (The Data Base System)** option module. The new module provides the first true multiline complete database capability in the industry. Compatible with **dBase III+**, the module not only allows system operators to port dBase .DBF files into an online environment, but actually allows extensions to the TBBS online system to be written in the dBase development language known to thousands of consultants around the world. This effectively opens up TBBS to the development of "door" programs in the dBase language and several TDBS beta testers were already set to release game software - among them Gary Funk of fSoft with an implementation of a card game titled **"Card Guppies"**. "Yes, it's a stupid little game," admits Funk, "but my callers love it and that's what it's all about." fSoft will be marketing Card Guppies at $49.95.

Becker also described plans for another option module, The Integrated Mail System (TIMS), featuring multiline, 24-hour automated mail functions compatible with such mail programs as BinkleyTerm and SEAdog - both popular in the International Fidonet

arena. Although no announcements were forthcoming as to who was on the programming team, BinkleyTerm authors Bob Hartman, Vince Perrielo, and Alan Applegate were noticeably present sporting eSoft T-shirts.

Long term plans call for development of a very small automated mail program capable of doing simple send and get operations from TBBS via a laptop and modem. Although as yet untitled, the program came to be referred to among conference attendees as **TBDM - The Brain-Dead Mailer**. It would allow executives/sales personnel to send reports and sales orders to the home TBBS system quite automatically. Becker was dubious his marketing group would go for the name.

Becker covered a flurry of new features to be incorporated in an April release of **TBBS Version 2.2.** The new product will allow online examination of files compressed with virtually all popular compression utilities such as **ARC, ZIP, LHARC,** and **PAK.** Also to be included in the new version is the popular ZModem file transfer protocol.

Although presentations were intense during the day, the after 5:00 PM action was even more so. Many attendees had returned from the previous year and the gathering seemed more social than educational. We have confirmed that there is no truth to the rumors about late-night swimming forays, raucous parties, and certainly no basis for the rumor that one magazine editor was thrown in the swimming pool fully clothed. Just didn't happen. There was however, some allusion to a twenty-foot tall plaster chicken that may in fact have some merit.

eSoft, Inc., 15200 East Girard Ave., Suite 2550, Aurora, CO 80014; (303)699-6565 voice; (303)699-8222 data.

LOCAL ACCESS

HEIM FAMILY EDUCATIONAL SOJOURN AROUND THE U.S.

Jane Heim seems to thrive on adventure. And she's not a bit daunted by new technology, bureaucracy, or patient explanations of why something "can't be done". An avid traveler, she wanted to make an educational trek around the entire United States of America and see the various historical sights with her two growing sons, JJ - 15, and Jeff - 11. Ms. Heim, who sports a BA in Education/English from Depauw University herself, also wanted a reasonably traditional course of study for her sons during the trip.

She saw a newspaper article in the Denver Post newspaper about Dave Hughes of Old Colorado City Communications in Colorado Springs. Dave was busily transferring files back and forth from his online service there to his son, Ed Hughes, located in Dailan China during the massacre in Tianamen Square. Curious about telecomputing technology, Jane contacted Dave about how this new technique could be put into play to allow her sons to continue their education while they toured the U.S.

Inadvertantly, she had hit a nerve. Dave, an instructor at West Point for many years and a pioneer in online interactive learning, had no small background in education himself. And he had just recently installed the Big Sky Telegraph system at Montanna State College to link dozens of one-room school houses across the state of Montanna. But mention education in Colorado and modems in the same breath and Dave turns purple, starts squirting blood from

around the eyes, and goes into a tirade that can last for hours. It involves recalcitrant administrators, teachers quaking in fear at the mention of the word "computer", and officials horrified at the thought of a telephone line in the classroom.

Mr. Hughes demonstrated to Heim what could be done with modems, electronic information services, and telecomputing in general but offered little by way of encouragement that they could persuade the schools to go along with it. But Ms. Heim began organizing the trip anyway.

By the time this energetic and persuasive woman was done, she had two SupersPort laptop computers from Zenith, a Ford Aerostar Minivan, a suitcase full of free meal tickets from McDonald's hamburgers, and the support of Dr. Ellen Wagner of the University of Northern Colorado and Dr. Barbara Randall of the Cherry Creek School district. Despite the fact that JJ's Cherry Creek High School declined to participate in the program, a transfer was arranged to Smokey Hill High School and they somewhat reluctantly agreed to support the project. Jeff, the younger son, attended Cottonwood Creek elementary school and they also agreed to allow Jeff to "go to school by modem".

Neither school had an online system, or for that matter any teachers particularly adept at online communications. Candy Colborn, of Cottonwood Creek Elementary School, had quite a bit of online experience but none of Jeff's other teachers and none of JJ's at all had tangoed with telecomputing in any meaningful sense.

So at the urging of Dave Hughes and Ms. Heim, we agreed to provide the facilities of the Boardwatch Online Information Service for the Cherry Creek Distance Learning Pilot Project. We also agreed to provide some basic instruction in online procedures to the various teachers who would need to interact with JJ and Jeff online to upload assignments, download completed work, and pass E-Mail messages to the Heims. Jane obtained an account on Telenet's PC Pursuit service to allow the family to dial into Denver to the Boardwatch Service at a flat monthly rate of $50 from nearly anywhere they would be traveling.

Jane resigned from her position in the secretarial pool of local Denver radio station **KRZN**, rented out her Englewood Colorado home, and on September 7, the Heims began their trek leaving Denver for Detroit in the Ford Aerostar. They traveled into Canada, back into the US to Vermont, Maine, and down through Boston to Philadelphia. Along the way, they saw John Hancock's Wharf, Lexington and Concorde, the Bell Tower where Paul Revere began his ride, the Liberty Bell, and of course the historic Sharper Image Catalog Store.

The trip is under a tight budget and the Heims typically spend their nights in a tent at local campgrounds. According to Ms. Heim, one of their most difficult assignments is locating an RJ-11 modular telephone jack to make the connection to Denver. Hurricane Hugo also provided a little added romance and the tiny group learned to both pitch and break down a tent in the rain. At this writing they are in Washington D.C. touring the White House, and two Denver television stations are struggling to get a camera crew there to film the story.

Ms. Heim reports that along the way they've met some wonderful people who all seem quite fascinated by the concept of "distance learning". Stopping at one library to do a bit of homework, the Heim's were invited into Jody Askman's third-grade classroom. They answered questions from the class regarding their sojourn across the country. Ms. Askman invited the Heims to stay over at her own home.

Dave Hughes, meanwhile, had posted a description of the sojourn on several large systems around the country. Soon, calls were coming in to the Boardwatch service from all around the nation with offers of hospitality, tours, and a place to stay. Gordon Cook, Science Editor for the von Neumann Super Computer Center in Princeton checked in to offer a complete tour of the facility.

The teachers have had a little difficulty in mastering the vagaries of online communication. Part of the problem, according to Nancy Long, JJ's English teacher, involves their current workload of over 120 other students leaving little time to specifically tailor individual instruction via modem for the Heims. Then too, the schools do not have computers in the classroom but like many schools, the computers are locked away in the "computer lab" - apparently a fairly noisy and distracting area. But at

least a few of the teachers view the project as an experiment in the future and are learning the in's and out's of sending E-Mail, attaching files, and the difference between private and public messaging.

The Heims on the other hand, have taken to the medium with gusto. JJ has actually been working on developing his own **RBBS** bulletin board on his laptop with only the two **720 KB** disk drives to work with and has developed quite a bit of enthusiasm for bulletin boards. Jeff, initially skeptical of the whole concept, has come around a bit as well and now seems quite comfortable online.

While the boys do their schoolwork by modem, Jane Heim has gotten into the swing of telecommunicating herself. She's been writing a serialized narrative of the trip and uploading it to the Boardwatch system. The descriptions are posted on a special menu in the Cherry Creek Distance Learning Pilot Project menu area for all to read.

The Heims will trek down the east coast to Florida, across the south through Texas, down into Mexico and up the California coast. They'll be spending Christmas in Silicon Valley with relatives and then traveling across the top of the country to Illinois. Return to Denver is projected for January 15, 1989. At that time, the two boys will rejoin their classmates in regular session.

The Heim's travel itinerary and other information on the pilot project is available on the Boardwatch Information Service. Interested parties may dial the service at (303)973-4222 and view the area. An ongoing discussion of educational issues has attracted something of a following. Naturally, most correspondence between teachers and the Heim boys is flagged "private" but you may address E-Mail inquiries to the Heims under the following user names: JJ HEIM, JEFF HEIM, JANE HEIM.

INTERLINK REGIONAL CENTERS

The following systems are InterLink Super Regional Centers and should be contacted directly for further information or to make application to join InterLink.

System	Sysop	Data Phone	Territory
Cheers	Bobble Sumrada	(901)373-5941	TN NC SC MS AL GA FL AR MO
Compu-Data	Phil Gordemer	(609)232-1245	NJ PA DE MD WV VA
Ed Hopper's BBS	Ed Hopper	(713)782-5454	TX KS OK NH LA NE CO
Executive Network	Andy Keeves	(914)667-4567	NY RI CT MA ME NH
LANs	Philip Stults	(219)884-9508	MI ND SD MN IA WI IL IN KY OH
Rose Media	Vic Kass	(416)733-2285	Eastern Canada
Sleepy Hollow	Jim Fouch	(213)859-9334	CA OR NV AZ UT ID WY MT HI AK

LONG DISTANCE USA

INTERLINK CONFERENCE NETWORK

by David Hakala

The International Fidonet has grown dramatically over the past few years largely on the popularity of "echomail". Echomail consists of over a hundred special interest message areas that are "echoed" between hundreds and in some cases thousands of other bulletin board systems. Any one BBS might not have a substantial number of callers interested in COOKING for example, but between the several hundred systems that share this echomail conference, several thousand individuals from all over the country can correspond on the topic of interest. And access to these echomail conferences is included in the cost of the system subscription fee, if any. By taking advantage of echomail, you can tap into a resource of several hundred or even thousands of people, many quite knowledgeable on your topic of interest.

I love FidoNet's EchoMail system. For the cost of a local phone call, I carry on E-mail conversations with people in Canada, Australia, even Saudi Arabia. But the world has not entirely "gone to the dogs." INTERLINK is a young but vigorous network of online services all running the PCBoard BBS software. "Conference" mail is its alternative to EchoMail, and in some respects a very attractive one.

Interlink sysops, for example, can send packets of mail whenever it's convenient, while all Fido systems must "go down" for mail runs at a rigidly specified time every night. "National Mail Distribution Sites" accept conference mail 24 hours a day. The centers relay regional mail to The Executive Network (914-667-4567), the one central processor for all conference mail. ExecNet repackages mail and shoots it back out to the Distribution sites, where local sysops pick up their packets and distribute the enclosed messages to their users.

Most Interlink sysops, like their Fido peers, schedule automatic routing of their mail packets during the wee hours, when long-distance rates are low. But the Interlink system allows greater scheduling flexibility. Turnaround time to send a conference message and receive a reply is "generally 1 to 2 days," according to the Interlink introductory bulletins. Depending on when mail is left and forwarded, mail sent within a Distribution Site region, say from Toronto to NY, may be answered the same day.

There are 89 systems on the Interlink node list dated June 26, including entries in France, Alberta, Ontario, British Columbia, Surrey and Essex (England), Oslo (Norway), and many of the United States. That's pretty good for a network founded in September, 1988. The US coverage is surprisingly even, though systems get rather sparse in the Mountain Time Zone. There are presently no Colorado Interlink systems; the nearest nodes are in Phoenix AZ (Tool Shop: 602-279-2673) and Orem UT (Lestat's Landing: 801-222-5899).

It's not surprising that a network "born to mail" has many lively discussions. It's common for one system to carry 80 to 100 conferences. Interlink hosts a myriad of technical/programming SIGs, but we were most impressed by its variety of offerings for folks whose primary language is not PASCAL.

There are conferences for parents AND kids, as well as police, veterans and disabled persons. Others cover investments, travel, legal issues, desktop publishing, photography, writing, consulting, medicine, transatlantic cultures, space exploration, ham radio, gambling, cuisine and other "real world" interests.

We enjoy fomenting revolution in the Anarchy Echo as much as the next guy, but for serious help outwitting the IRS, there's no place like the Small Business conference. The running comparison of US and Canadian taxation systems makes us even more grateful to be red-white-and-blue.

We found substantial activity in the Job Bank conference, where many corporate employers are posting juicy openings for programmers, systems engineers, technical writers, and other likely modem-maniacs. Job-hunters are also announcing their talents and availability.

The national BBS Ads conference is apparently well-read. Many of the ads were gorgeous ANSI masterpieces. Such art is not easily created; the advertisers must expect good response. A short vanilla message about our own new venture started a steady shower of callers within 24 hours. We'll be back there.

BELLSOUTH GATEWAY ATLANTA JOURNAL-CONSTITUTION CLASSIFIEDS ONLINE

by David Hakala

One of the primary information providers on the Bellsouth Transtext Universal Gateway online service is the Atlanta Journal-Constitution newspaper. The Atlanta Journal-Constitution posts its Sunday and daily classifieds online the day BEFORE they appear in print. Callers can locate any ad using a tricky but effective text-string search function which allows you to start with a broad universe and narrow it down by adding search keywords. There are no per-record download charges, and connect time is $0.10 per minute plus long-distance or packet carrier charges.

The classifieds are available on Bellsouth's Transtext Univeral Gateway ("Let **TUG** take you... to the world of infomration services."). Access is not limited to users of the RBOC's regional packet service; anyone anywhere can dial it direct at (404)594-3964. Press **ENTER** until the main menu appears, then enter **NEW** at any prompt to register for a tour of the system. There is no "browsing fee;" you do not start paying until you actually enter an infoboutique. Bellsouth mails you an invoice rather than having the charge appended to your telephone bill.

I'm of Italian heritage and an impatient Scorpio to boot, so Bellsouth's billing-validation routine didn't sit well. Actual use of the many databases requires calling Bellsouth customer service for an application form, applying in writing for validation, and waiting for snail mail turnaround. There has to be a better way!

Chris Jennewein, Director of Information Services at the Journal-Constitution, says about **5** to **6** Megabytes of classifieds are posted each Sunday; weekday volume is naturally lower. He estimated help-wanted Sunday volume (our example) at **3,000** to **4,000** ads. We found over **2,900** help-wanted ads in the September 17 edition. Yet it took less than one minute to locate all 123 ads containing the word "computer."

The Journal-Constitution is providing online information Joe Public can use to save time and make money, at prices he can afford. These are the forces driving

the grassroots Online Revolution. There are more than enough online movie reviews, weather reports, games and other fluff out there, but print publications have been incredibly slow to seize the online-classified opportunity. The Journal-Constitution is the only major newspaper we found in an index of literature on gateway services that puts its entire classified section online every day -- actually, the "previous" day. It is be congratulated for this pioneering contribution to populist modeming.

We have talked with many print publishers who think videotext is a passing fad, that modems will never become mass-market media, that people prefer to buy something they can hold, etc. They should listen to their typesetters, who held equally chauvinistic opinions on desktop publishing. Among our **123** help-wanted ads, we found a dozen requiring familiarity with Pagemaker, MacIntosh computers, Ventura, etc. -- but only one employer seeking a traditional heavy-equipment typesetter.

Even our own Boardwatch editor long thought a monthly publication would not sell online. Now, as orders for the electronic edition of Boardwatch pour in, it gives us delicious satisfaction to say "We told you so, Jack!" and wish him continued success (just reserve some of the extra money for our next raise, eh?)

Access to TUG: Bellsouth Advanced Networks, P. O. Box 767174, Roswell GA 30076-9891. Voice: **(404)587-3819**. Modem registration & preview: **(404)594-3964**, 8-N-1 1200/2400 baud. Atlanta Journal-Constitution, Information Services: P. O. Box 4689, Atlanta GA 30302. Voice: **(404)222-8000**.

DATALINK DALLAS - WEATHER SATELLITE PICTURES ON YOUR PC

A group of HAM radio operators down in Texas have developed an interest in tracking satellites and specifically in building "ground stations" to receive National Oceanographic and Atmostpheric Administration (**NOAA**) and Soviet weather satellite pictures. The group is called the Dallas Remote Imaging Group and they're headed by Dr. Jeff Wallach, Chairman.

He operates an online information service titled the **DATALINK RBBS SYSTEM** at (214)394-7438. The system offers a treasure chest of data on satellite tracking, weather imaging, and other space related topics.

Most fascinating was a bulletin on how to build your own ground station to receive weather images from satellites. Essentially, it involves a radio capable of receiving frequencies at **137.500 MHz**, a demodulator to capture the digital data, and software to display the data on your personal computer. The article gives some detail of not only how to do it, but a full list of sources for each of the components and actual frequencies of the various "birds" that transmit such data. The data arrives on a **FM** modulated carrier as a **2400 HZ** tone carrying digital images much akin to transferring **GIF** picture files by modem.

The system has some actual images available for download in GIF format that you can use to see if these images hold any interest for you before you go out and start assembling your ground station. **LANDSAT** images may be captured as well.

To do all this, you also need to be able to detect where in the sky your target satellite is at any one time. Software is available to calculate this but you will need some current data on the satellite as well. This is known as Keplerian elements and they too are available on this system.

The service also carries data on some 5000 satellites including launch date, decay date, frequencies etc. Soviet Military Satellite frequency lists are available as well as US Military HF and VHF frequencies. Soviet space activity updates are online as well as NASA bulletins on satellites.

All the information we saw was very well focused on the satellite theme and seemed to be exhaustive in scope. The system asks for a $24.95 annual donation and this does seem to be required to download from some of the areas.
Dr. Jeff Wallach, Chairman, Dallas Remote Imaging, PO Box 118053, Carrollton, TX 75011.

BOARDWATCH SUBSCRIPTION GIVEAWAY!

As we prepare to welcome the 1990's, Boardwatch is stepping up its coverage of the online phenomenon that will, we believe, dominate and shape the last decade of the 20th Century: "infopreneuring," the business of gathering, organizing and distributing information.

YOU and your modem-driven business are the heart of the Information Economy. Send us a profile of your online venture and we will send you **ONE YEAR OF BOARDWATCH -- FREE!** Business profiles must include:

1. The venture's name, owner/operator's name, mailing address and voice phone number (withheld from publication by request).

2. Public-access modem number. Our readers must be able to dial up your system and obtain at least a "guided tour." Your service should be generally available, not restricted to employees of a single company or members of a small group. In other words, you should be truly "open for business."

3.. A summary of the services you provide, the hardware and software used, Years in business, approximate gross annual revenues, average number of hours devoted to the business per week .

4. A paragraph explaining how/why you got started in infopreneuring. We also welcome infopreneurs' comments about running their businesses, the opportunities in infopreneuring and any advice to newcomers.

5. A photograph of you and your system or of you and some symbol of your area of specialization (i.e. telescope for astronomy related systems). All photos should be 5 X 7 or 8 1/2 X 11 inches.

THIS IS NOT A CONTEST -- everyone who submits a profile meeting these criteria will receive a **FREE SUBSCRIPTION.** The editorial staff of
Boardwatch will consider every submission for publication in future editions. So it doesn't matter if you are already half as big as CompuServe, or just got your first check last week -- you **ARE** an infopreneur, and we want to tell your story.

US DEPARTMENT OF COMMERCE ECONOMIC BULLETIN BOARD

A case could be made that the US Department of Commerce is one of the world's most generous sysops and no where does that show more clearly than on their **Economic Bulletin Board.** The system operates at (202)377-0433 using RBBS software. To do anything substantial on the system requires a $3 per hour fee during evenings and weekends and $6 per hour during business hours, but the system offers a wealth of economic statistical information simply unavailable elsewhere.

The board is supported by the Bureau of Economic Analysis, the Bureau of Census, Bureau of Labor Statistics, and the Federal Reserve Board and is actually run by the Office of Business Analysis. As a result, data on Gross National Product, Consumer Price Indices, Employment Statistics, Housing Starts, Monetary Statistics, Foreign Trade Statistics, Productivity, Energy Development, and Interest Rates are all posted on this system **WITHIN MINUTES** of their release by the government.

One item that caught our eye was a daily Trade Opportunities alert (TOPS) listing 30 to 50 leads each day on foreign export opportunities provided by the US and Foreign Commercial Service. In fact, extensive online information is available concerning their current efforts to provide a National Trade Data Base (NTDB) of unprecedented proportions scheduled to go online in August of 1990.

If your business is affected by the vagaries of interest rates and other economic information released by the government, this service is close to the source, cheap, and thorough. US Department of Commerce, National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161; (202)377-1986 voice.

TV SATELLITE ONLINE SERVICE

If you are at all involved in the ongoing war between cable tv, satellite dish owners, and the scrambling and legal issues surrounding them, the **CATHOUSE II SUPERSYSTEM** may be just the online service you're looking for. The Cincinnati-based service runs on a multiline TBBS system at **(513)528-0505** and offers information on "your rights" as a satellite dish owner.

The system is operated under the auspices of Seed City Engineering Company and it is clearly, nay rabidly, anti-cable tv. The very forthrightly accuses cable television operators of outright theft of your money and they cite the United States Constitution rather liberally to support the use of Satellite Dish technology as a component of free speech.

In fact, we pieced together a rather interesting story concerning this system. It seems that some unnamed party is selling a replacement ROM chip for a **Videocypher** descrambling device. By installing this chip in your descrambler, all you need is a monthly coded number to enter to receive satellite-borne pay movie services free of charge.

Strangely, **CATHOUSE** publishes a monthly LOTTO number with little real information on how you win the lottery. While we're not sure what this does, the numbers bear a striking resemblence in format to the numbers you would enter each month to enable this satellite pirating device. Subscriptions to the system are available at **$50.95** annually. Seed City Engineering, 4166 McLean Drive, Cincinnati, OH 45255.

MICROLINK B
Multiline BBS (303)-972-9600
DESIGNED AND OPERATED FOR THE SERIOUS BBS USER

WHAT IS MICROLINK B?

Microlink B is the largest electronic Bulletin Board System (BBS) in the area, specializing in files and message services for the IBM-PC, XT, AT and compatible systems.

Microlink B has been serving the BBSing community since 1985 with quality public domain and shareware software, as well as interesting and informative message areas covering a variety of topics.

FILES, FILES AND MORE FILES

Your membership to Microlink B gives you immediate access to thousands and thousands of files that you can download directly to your computer. There are presently over 31,000 individual files available, and we are continuously expanding our collection. You can have everything from games to statistical calculation packages, database programs to personal finance managers, programmer's aids to computer communications utilities. Put simply, we have one of the most extensive software collections for the IBM-PC and compatibles in the country.

There's more... Microlink B maintains the complete 1,000 disk PC-SIG software library available on-line for our members. We think you'll agree that the PC-SIG library is one of the most comprehensive software collections available for the PC.

We do not provide software for the Mac, Amiga, or other non-IBM compatible machines. Why? Because we think it's better to put all our effort into providing you with the best possible software collection for your IBM-PC or compatible system.

TALK, TALK, TALK

We do messages too. The Microlink B message base is connected to the world via the FidoNet public amateur network. We 'echo' many of our message areas to other FidoNet systems in the area, across the country, and around the world. This means you can ask a question on Microlink B, and receive answers from experts all over the world.

We have message bases covering a variety of interesting topics from programming and technical issues to law, from aviation to using Lotus-123. And, yes, we do offer private E-MAIL message areas where you can leave confidential messages and files for other Microlink B members.

Microlink B also offers USA Today's Decisionline, a computerized version of the popular USA Today newspaper. Decisionline is updated early every weekday morning.

WHAT YOU NEED

To access Microlink B, you'll need an IBM-PC or compatible computer and a modem capable of operating at 1200, 2400 or 9600(HST) baud, as well as one of the many communications software packages that are freely available.

TAKE A TEST DRIVE TODAY

You can call Microlink B anytime to take a test drive. Set your communications program for 8 data bits, no parity and one stop bit (refer to instructions for your modem or communications software). Dial Microlink B at (303)-972-9600. Microlink B will ask for your full name, and then guide you along the way with easy to follow menus. You'll be able to tour the system, read messages, and look over our software collection.

BECOME A MICROLINK B MEMBER

For just $35.00 you can have full access to Microlink B for one full year, or pay just $25.00 for six months access. Use the handy order form below to become a Microlink B member. For your convenience, we now accept Visa and MasterCard.

Prices and specifications are subject to change without notice.

Registration Form **Microlink B** (303) 972-9600

P..O. Box 620247 Littleton, Colorado 80162

YES   I want FULL access to Microlink B!

____One Year $35.00   ____Six Months $25.00

____Check Enclosed   ____Visa   ____MasterCard

Credit Card # _____

Expiration Date _____

Signature _____

Name_____Date_____

Address_____

City_____State_____ZIP_____

Telephone(____)_____

Name you will use for BBS Logon

First_____Last_____

Password_____

Macintosh Terminal Software

Acknowledge Version 1.0 $495	Prometheus	7225 SW Bonita Road, Tigard, OR 97223	(503)624-0571
Blast Version 8.1 $195	Comm. Rsrch Group	5615 Corporate Blvd., Third Floor Baton Rouge, LA 70808	(504)923-0888
DynaComm Version 1.02 $295	FutureSoft	1001 South Dairy Ashford, Suite 203 Houston, TX 77077	(713)496-9400
FrontEnd Version 2.03 $179	Kaz Business Sys.	10 Columbus Circle,New York, NY 10019	(212)757-9566
Mac 240 Version 3.0.1 $199	White Pine Software	94 Route 101A Box 1108 Amherst, NH 03031	(603)886-9050
Mac 3000 Version 3.2 $149	Intl Computer Consult.	1311 Clegg Street, Petaluma, CA 94952	(707)765-9200
MacKermit Version 9.04 $20	Columbia University	612 West 115th St., New York, NY 10025	(212)854-3703
MacLine Version 3.0 $145	Touchstone	909 Electric Avenue, Seal Beach, CA 90740	(213)598-7746
MicroPhone II Version 2.0 $295	Software Ventures Corp.	2907 Claremont Ave., Berkeley, CA 94705	(415)644-3232
MockTerminal Version 4.4 $49.95	CE Software	1854 Fuller Road Box 65580 West Des Moines, IA 50265	(515)224-1995
QuickLink II Version 1.0 $99	Smith Micro Software	PO Box 7137,Huntington Beach, CA 92615	(714)964-0412
Red Ryder Version 10.3 $80	Freesoft	150 Hickory Drive, Beaver Falls, PA 15010	(412)846-2700
MacTerm Version 2.0 $99.95	Borland International	1800 Green Hills Road Scotts Valley, CA 95060	(408)438-8400
Telescape Pro VT100 1.2 $125	Mainstay	5311-B Derry Ave., Agoura, CA 91301	(818)991-6540
TexTerm Plus Graphics 1.0 $195	Mesa Graphics	PO Box 600, Los Alamos, NM 87544	(505)672-1998

INVESTOR'S ONLINE DATA

Don Shepherdson runs an excellent specialized information service up in Bellevue Washington titled **INVESTOR'S ONLINE DATA** at (206)285-5359. The service provides information on the stock market, money markets, and mutual funds with a heavy slant toward the technical analysis crowd.

The "Daily Stock Comment" and "Daily Metals Comment" seem to be very popular on this system with a clear, direct summary of the days trends and a very nearly courageous prediction for the next day in the ones we saw. Over 650 public domain software programs are available specifically on the stock and bond markets and technical analysis of moving averages and so forth.

Probably one of the greatest resources this system offers is access to its other users. We saw numerous uploads of very detailed analysis done on specific companies and uploaded by users to the system. Textronix, Amdahl, and Taunton Technologies seemed to be getting a lot of recent attention.

The service also provides some news services such as USA Today Decisionline Update and Newsbytes online. USA Today provides a good general news summary each business day and Newsbytes provides an overview of the computer industry on a weekly basis.

Overall, **Investor's Online Data** is clearly a resource for serious investors and appears well executed and well run in all respects with a very real sense of identity and focus on a fascinating theme. Investor's Online Data, PO Box 70471, Bellevue, WA 70471.

SOFTWARE

POPUP BACKGROUND DISK FORMAT & PRINT SPOOLER

by David Hakala

Wouldn't it be nice if you could download a 100 Kbyte BBS file, format a new pack of floppies and print a few hundred mailing labels - all at the same time? We've done exactly that, with no degradation of performance or conflicting applications. You don't need a 386 multi-tasker or dedicated hardware, either. Two outstanding shareware utilities turn any IBMcompatible into a three-ring circus. Memory-resident programs are notorious for their conflicts with other software, but we've had no problems with these two in combina-

tion with each other and a variety of software -- even with five other pop-ups resident! Both allow the user to change the hot-key combinations that activate them, preventing conflicts among application commands.

CONFMT.COM (Sydex, (408)739-4866 voice) handles floppy formatting, a chore about as interesting as pumping gasoline. CONFMT.COM will format a diskette to any standard capacity, in any type of floppy drive, and will run under MS-DOS 4.1 or less. Just tell it the drive letter and choose one of your customized formats from its menu. The utility modestly retires to the background to format and verify the diskette, while you continue computing. When it is finished, CONFMT.COM notifies you of any media errors and asks if you want to format another disk. Its return has never caused us to lose a keystroke in the foreground application.

While hard disk access is no problem at all. CONFMT.COM will not permit access to any other floppy drive while it is formatting a diskette in one. But an attempt to access a floppy drive will not bring on a crash, either. CONFMT.COM politely tells you to wait, then frees you to go back to your application. A lot of thought went into this 10 Kbyte TSR; if only more humans were so considerate! We haven't seen a commercial equivalent of CONFMT.COM (it should have been built into DOS). CONFMT.COM is a steal with registration at $15. Sydex, 153 N. Murphy Ave., San Jose CA 94086. Voice:(408)739-4866.

SP2.COM (Budget Software, (303)605-9095 voice) is a feature-rich print spooler that also stays out of your way, taking up just 35 Kbytes of RAM. In its simplest configuration, SP2.COM intercepts any program output destined for the printer port and directs it to a disk file. (But there are other intriguing possibilities; read on.) Unlike RAM-resident or hardware spoolers and buffers, capacity is not a practical concern. When the entire document is on disk, your computer is freed up again. A letter-quality document that normally takes 10 minutes to print spools to disk in about 30 seconds. SP2.COM can be configured (and re-configured while in memory) to begin printing out the spooled file as soon as spooling is finished, wait until you tell it to print, or print from the spooler file as fast as it fills. The last method does tie up the computer a bit longer; we prefer to use the first. Text can be

spooled to any filename, in either compressed or what-you-see-is-what-you-get form. Compression conserves disk space, while the WYSIWYG format creates files that look exactly like the printed versions.

Many shareware spoolers assume you'll be printing only for local use; they support printer ports LPT1 and LPT2. But SP2.COM also intercepts text coming in via COM1 or COM2, and can spool or print to COM1 or COM2 as well. With SP2.COM memory-resident and your modem locked in auto-receive mode, you have a background text-only mailbox waiting to receive documents! You could also use SP2.COM and your modem to transmit documents while working on another. The person on the other end doesn't need SP2.COM to print what you send. WYSIWYG files are straight ASCII, while spooled and compressed files can be printed using the author's SPOOL.COM utility. Shrink-wrapped spooler programs often sell for over $100. SP2.COM's registration fee is $35. Budget Software, PO Box 12282, Aurora, CO 80012; (303)695-9095.

NOVICE NOTES

Local computer retailers are noting significant increases in the numbers of PC units that go out the door with modems installed compared to a year ago with one Colorado Springs retailer claiming an increase from 25% of units sold last year to 70% of his units modem-equipped this year. The efforts of the regional Bell telephone companies to promote their online gateway services coupled with an advertising and direct mail media blitz by Prodigy Services Company introducing their Prodigy online service has raised public consciousness of online services by an order of magnitude.

But the online learning curve still presents an entry barrier of inexcusable proportions for most new PC owners. While none of the required information is particularly difficult to master, it's not exactly intuitive either. You can't take it apart with a hammer and tell what it is by looking at the pieces. And much of it only has to be done the first time - many old hands at the online game do not remember precisely the steps to installing terminal software, setting initializa-

tion strings, etc. themselves since they originally got it up and running two years ago. The result is a vast number of individuals equipped with a modem in their PC who never completed the first connect. The machine was probably purchased primarily for a word processing or database application anyway and after a few tries at communicating the owner gave up in disgust and frustration, wrongly assuming that it was they themselves who were inadequate.

The hard facts of PC telecommunications are that no matter how enthralled we all are over what can be done online, it is still an infant industry sorely lacking in both technical standards and interface design sophistication. In this column, we will provide basic tips, techniques, and term definitions to bring the newcomer to telecomputing online.

About 99% of all difficulties encountered in getting your first modem to connect to the first service involve getting your terminal software program to work with your modem. At this point in the game virtually all terminal programs do work with virtually all modems. However, to get them to work you must essentially "marry" the software to the hardware by specifying an "initialization string".

The initialization string essentially resets the modem to an initial condition and readies it for operation. It also specifies such esoterica as what type of result codes the modem sends back to the computer to denote a busy signal, connect, or lost connection. Each time you load your terminal program, it sends this initialization string to the modem as a command to establish a basis for further communications.

Initialization strings are made up of a series of modem commands. Virtually all modems now support some variation of the HAYES AT COMMAND SET. This is simply a list of fifty or sixty alphanumerics that can be sent to a modem to tell it to dial a number, answer the phone, turn on the speaker, etc. Virtually all modems claim 100% Hayes compatibility. In truth, we haven't found a single modem that is 100% Hayes compatible. Few modem manufacturer marketing departments want to proclaim in bold letters on a national magazine page "72% HAYES COMPATIBLE MODEMS." So they "market the product" - a corporate euphemism meaning "to bullshit profitably".

So in reality, almost all modems require their own special initialization string to work properly. And discouragingly, there are few indications to tell you where you went awry. If you can figure out the correct modem initialization string, it usually works pretty well although you can fine tune it subtly to make the speaker louder, hangup faster, and so forth. But often, if you get a single character in the string wrong, the resulting indication is that the modem doesn't do anything. I term this the "electric brick-bat response". It just lays there. Even experienced system operators spend many hours with bone dice and chicken entrails trying to devine the initialization string that will let their new hot dog modem work with their BBS software. But once it is up and running, there's just the litter of empty Dr. Pepper cans and 3200 half-smoked cigarette butts to testify to the frustrating trial they went through.

The typical initialization string looks something like the one shown below:

AT V1 QO EO X4 &C1 &D3 S0=0

We could go into a detailed description of what the **V1** setting does, the **Q0**, the **E0**, and so forth but it would become a tutorial rather than an article and all this information is defined in your modem manual. But note that the string does begin with an **AT** which stands for **AT**tention and it alerts the modem that the following characters are commands. This is what is meant by the term the Hayes **AT** Command Set.

Also note that some "100% Hayes Compatible" modems require all commands to be upper-case characters, some lower case characters, some will accept either. Some modems demand a space between each command while most allow you to run all commands together as

ATV1Q0E0X4&C1&D3S0=0.

We wrestled with a CTS Datacomm for hours before we noticed that the examples in their manual had spaces between each little command segment. When we put the spaces in, it lit up like a Christmas tree and started squirting bits all over the country. Without the spaces, it was a desk brick.

Terminal software programmers often want their programs to work with every conceivable modem type and so they too put a few hundred "options" in the program. The program options and the modem parameters specified by the initialization string must match. But there are hundreds of combinations and it can be difficult to get them together once you've started making changes. This is an utterly chaotic situation where there are simply no standards and where there was a glimmer of one, everyone "tailored" it to the point of nonsense. The bottom line is that it is not your fault. It is truly a nonsensical situation that must be addressed primarily by modem manufacturers who spend too much time fighting with each other and not enough time bringing a little vision to the field.

The best approach to initialization strings is to get your dealer to do it for you when he installs the modem. And write the actual initialization string that did work at least once in a row into the cover page of your modem manual in case you change software later. Once the initialization string is entered into the setup of your modem program, you will never see it again so an education in initialization strings is of dubious value. But here is a process that usually will get you there the first time.

1. Install the terminal software from scratch from the original diskette or archive file. Accept all default configurations for now.

2. Read the modem manual carefully. Despite the hundreds of options they provide, most modems are used for only a handful of tasks and yours is likely to be among them. They should have a sample initialization string near the front of the book. The rest of the manual will describe what each option does. You need the initialization string samples in the front.

3. Go to the terminal software manual or documentation to find how to enter the modem initialization string. There will usually be a setup screen for the program and a special area for the modem initialization string. On GT Power, for example, you access this screen by pressing ALT-I. On Telix, the ALT-O key calls up terminal configuration and you then select **MODEM AND DIALING** to enter the initialization string. But all terminal programs have a configuration setup function to allow you to enter initialization strings.

4. Examine the existing default initialization string currently in the terminal program. Note any characters preceding the **AT** command and the last character in the string. **AT** commands must be terminated with a carriage return. Some software signifies this with a piping symbol (|) the symbol produced by the **SHIFT- BACK-SLASH** key combination usually. Others use the **control-M** combination (**^M**) produced by the **SHIFT-6** key on most keyboards followed by a capital M. Most do not require a terminating character.

5. Enter any characters required by the program to precede the initialization string, the initialization string from the modem manual precisely, and any termination characters. Pay careful attention to the initialization string in the book. Note spaces between the commands or lack of them, capital letters, or lower case and make sure the string you enter matches the book's examples exactly.

6. Save the configuration by using any **WRITE TO DISK** or **SAVE CONFIGURATION** options necessary. Exit your program and then restart it. At the terminal screen, type **AT** and press the carriage return. You should see an **OK** appear on screen. Now try dialing a number by entering **ATDT 973-4222**. If the modem dials the telephone, you have very likely been successful.

Initialization strings can be much easier if you can find someone using the same type of modem and software and simply ask them what modem initialization string they use. But don't be discouraged by the process. Once the modem and software are working together, it is **NOT** something you will deal with or even think about again.

TEST YOUR ONLINE I.Q.

by David Hakala

This is written for modem novices, know-it-alls and people with a twisted sense of humor (that's why I'm writing it - DH). We hope you'll enjoy and perhaps learn something new from it.

1) A "baud" is

   a) what steroids are supposed to give you
   b) the kind of girl Mother warned you about
   c) "screeching" sound as modems connect
   d) unit of data transmission speed

2) Downloading is performed

    a) to acquire a file from another computer
    b) to send a file to another computer
    c) to move furniture from an upper level condominium
    d) to make a warm quilt

3) ANSI.SYS is

    a) Ansi Kyoto's kid sister
    b) a BBS caller who impatiently leans on the Enter key
    c) a terminal screen device driver
    d) a nervous system disorder

4) If [0;0 F appears on your screen it-means

    a) you've connected with a BBS in Moscow - at $4 per minute
    b) the sysop is talking dirty to you
    c) there's noise on the phone line
    d) you need to install **ANSI.SYS** device driver

5) COM1 is

    a) a supersecret military intelligence unit
    b) the connection where you plug in your modem
    c) a variable containing the address of a comm port
    d) the code name of a top Russian spy

6) "8 data bits" is better than "7 data bits." What do you think:

    a) True; more information is carried in each bit
    b) False; a 7-bit byte travels faster
    c) It depends on the system you're calling
    d) It doesn't matter at all

7) A "stop bit"

    a) halts a runaway horse
    b) is a phrase yelled to make children cease what they're doing
    c) signals the end of a transmitted data byte
    d) none of the above

8) a "sysop"

    a) operates a bulletin board system

    b) smokes a lot and drinks Dr. Pepper from the can
    c) giggles insanely while you fumble around his menus
    d) all of the above

ANSWERS:

1: D -- a baud is a somewhat archaic measure of data transmission speed representing the number of discrete signal elements transmitted in one second. Where modems are concerned a discrete signal element is a change in frequency (tone) used to carry information. The term derived from French telegrapher **Emile Baudot (1845-1903)** who developed the five-bit **BAUDOT** code for transmitted alphabetical characters by telegraph. In the early days of modems, a baud corresponded directly to the transmission of a single bit of data via a change in the audio tone from one frequency to another. So a **300 baud** modem transmitted data at **300 bits-per-second (bps)**. As modem speeds advanced, the bandwidth limitations of the telephone circuits pretty much limited the rate at which tonal changes could occur to about **600 baud**. But advanced phase-shift keying modulation techniques allowed the encoding of two, four, and even eight data bits into a single tonal change - throwing the direct correlation between bps and baud askew. As a result, a **2400 bps** modem is actually transmitting audio tonal changes at **600 baud** with a phase-shift encoding technique allowing four bits of data for each tonal change to accomplish a **2400 bps** rate. So the **bps** and **baud** are no longer equivalent and haven't been since the advent of 1200 bps modems.

2: A -- the calling party normally downloads a file **FROM** the host system. Likewise the calling party uploads a file **TO** the host system. The phrases "download" and "upload" are relics from the days of mainframe worshippers, who imagined that the high priests in MIS were somehow "above" the end user. If you requested a data file, it came "down" the hierarchy and was "loaded" into your dumb terminal. One sent files "up" to Olympus with a prayer they would be processed before next year. Nowadays, mainframers might well be "downloading" from a Commodore 64.

3: D -- ANSI.SYS is a terminal device driver that comes on your DOS diskette. The **American National Standards Institue (ANSI)** actually publishes

hundreds of standards specifications. One among them specifies how a terminal should react to certain control codes. IBM implemented that standard "partially" in their **ANSI.SYS** device driver. By using the driver, your terminal can receive and properly process **ANSI** graphics codes to turn on boldtype, underline, change colors, and position the cursor. Many IBM-based BBS use **ANSI** codes to create very colorful and attractive screens.

4: D -- ANSI codes are fairly easily distinguished from random line noise. They always start with a left-arrow (the graphic equivalent of the Escape key), followed by a left-bracket ("["), number(s), and sometimes a letter. The example [0;0 F moves the cursor directly to the top left corner of your screen (coordinates 0;0) -- if ANSI.SYS is installed on your end. If it's not, you actually see the control codes printed to the screen as numbers and brackets. To install ANSI.SYS, use a text editor to add the following line to your CONFIG.SYS file: **DEVICE=ANSI.SYS**. Check to make sure the file ANSI.SYS that came with DOS is in your root (top level) directory. Finally, make sure your communication program has ANSI-BBS selected as the default terminal emulation.

5: C -- COM1 (or COM2, COM3, etc.) is often confused with a physical part or location on your computer. In fact, the computer could care less where your modem is physically located (in an internal slot or outside the box). When you power up the PC, it tests to see what is connected where. It labels serial ports found COM1, COM2, etc., and stores a number in that label telling it where to find that serial port when it's needed. The addresses are usually referred to in hexadecimal notation with **COM1** at address **3F8-3FF** and **COM2** at address **2F8-2FF**. One of the most common mistakes in BBSing is to let your communications program look for the modem on **COM1**, when in fact the modem or the serial port it is attached to is configured as **COM2**.

6: C -- both computers must agree on how many bits will be in each character they exchange, or absolutely nothing useful will happen. Virtually every BBS uses 8 bits; 7-bit bytes are common on mainframe systems and packet carriers such as Telenet, Tymnet, etc. If you connect to a system and get solid lines of "garbage," often "C" or "X" characters, you might try changing from 8 bits to 7 bits or vice versa.

7: C -- most systems use one stop bit to designate the end of a transmitted byte. Each character is really made up of 10 bits, regardless of selection. A start bit, eight data bits, and a stop bit, or perhaps a start bit, seven data bits, a parity bit, and a stop bit. In some very rare teletype applications, a start bit, seven data bits, and two stop bits were used.

8: D -- all of the above. **SYSOP** stands for **SYS**tem **OP**erator, and they are by and large an eccentric bunch. Some are very laid-back and helpful to novices, while others seem to think they hold the key to the ultimate online treasure, and every new caller is out to steal it.

It's not difficult to gage the attitude of a new host. The mellow ones generally want to know who you are and how to reach you (by voice call or mailing address), and offer help if you ask for it.

The uptight sysop wants to know your Social Security number, sexual preferences, annual income and other things you wouldn't share with a total stranger without a much better reason than he's given you. Then you'll be treated to a stern and lengthy lecture on "**YOUR RESPONSIBILITIES AS A USER**" and "**MANDATORY READING -- POLICIES OF THE REICHSTAG BBS.**" Unless, of course, you have the sense to hang up. After all, there are so many boards, and so little time!

EDITOR'S NOTES

It's a heady time for online infopreneurs as software and hardware continue to advance in features and drop in price. The 300 or 400 MB storage capacity system is no longer unusual and services of over a Gigabyte of online storage are appearing with regularity. At the same time, there is a dawning awareness among the general public about "what is going on" with the world of online communications and we look for dramatic growth in the numbers of telecomputing enthusiasts in the coming months. The recent TBBS conference held in Englewood Colorado had a noticeably "upbeat" theme with many of the "pay" BBS operators reporting increasing subscription levels
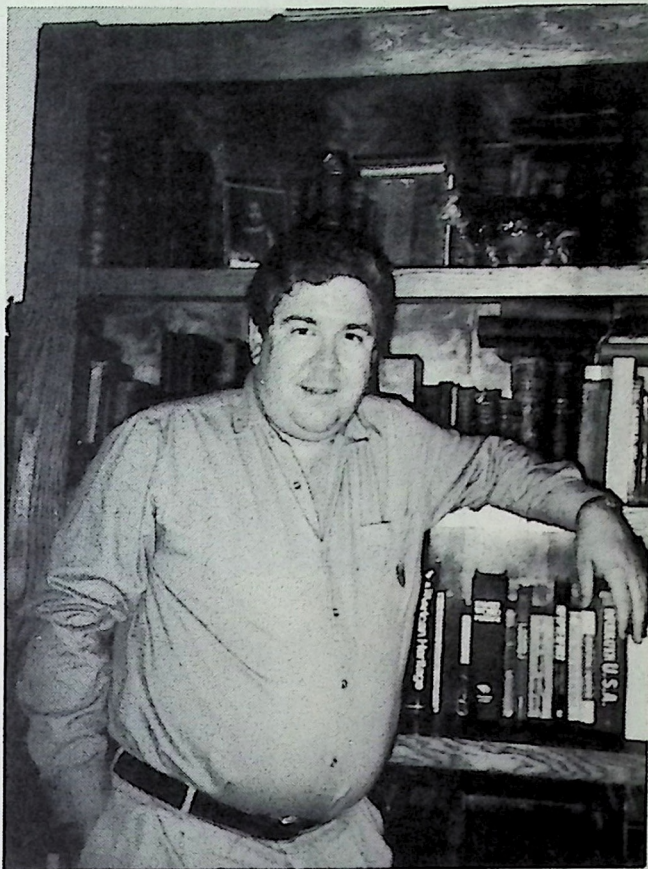
and a general feeling that online information services were "turning the corner" to profitability.

There was also an increasing presence from the field of education at the TBBS conference with representatives from Modesto Junior College in California and several school districts in the Canadian provinces, including a fascinating fellow from New Brunswick in attendance. While our story on the Heim family is a bit off our normal beat, it points up a trend toward the use of telecomputing in education and in a wider sense in non-computing human endeavors in general. Up to this point, the industry has largely been introspective - with most of the participants hobby enthusiasts whose favorite subject to discuss online was about being online and what hardware and software helped them get there.

But that is a bit sterile in the long run. We are just now at the dawn of a period where creative individuals will be applying this technology to non-computer activities. Education. History. Science. Business. And the multitude of hobbies and leisure activities that cry out for "information clearinghouses" to make

available the frequently large bodies of inside information necessary to enjoy such activities. Where are the best ski resorts? Where do you find morrels and other edible fungi? How do you build a weather satellite ground station? What do you need to go white-water rafting? And specifically, who did win the 1947 World Series? What's a good pure investment play in the hydrogen energy market? The tools are falling into place. The economics frankly still aren't there yet. But by the time they are, you will have missed your window of opportunity to become known as THE online service with THE definitive body of information on ballroom dancing. And the poor pair of dancers that spent months or years putting it together out of their own pocket using time they could have spent dancing, will suddenly have a new career in online information services.

Ciao' Com Padre Sayonara Kimosabe Adieu Joe - No Shit.

Jack Rickard, Editor

BOARDWATCH MAGAZINE

NATIONAL LIST OF ELECTRONIC BULLETIN BOARD SYSTEMS AND ON-LINE INFORMATION SERVICES - NOVEMBER 1989

SERVICE	PHONE	DESCRIPTION	SPONSOR/SYSOP	LOCATION
ADA Information Clearinghouse	(202)694-0215	Information on ADA Programming Language/Military Specs	Department of Defense	Washington ,D.C.
ANARC BBS	(913)345-1978	World Radio/TV Handbook - Short Wave Freq Lists/Scheds.	Assoc. of North American Radio Clubs	KS
Ashton-Tate Technical Support	(213)538-6196	dBase and Multimate Software Support System.	Ashton-Tate Corporation	Torrance ,CA
AST Technical Services BBS	(714)852-1872	Superb support system for AST Computer Products	AST Research Inc.	Irvine ,CA
AT&T Support BBS	(201)769-6397	Support for PC 6300 and Other AT&T PC Models	American Telephone/Telegraph PC Division	Plainfield ,NJ
BBS Press Service	(913)478-9239	Home of INFOMAT Online Weekly PC News Magazine	Alan Bechtold/BBS Press Service	Topeka ,KS
BellSouth's TUG Gateway	(404)594-3964	Transtext Universal Gateway - Atlanta Journal-Constitution	BellSouth	Atlanta ,GA
Big Peach BBS	(404)446-6650	Home of Automenu and Treeview Software	Marshall Magee/Magee Enterprises	Norcross ,GA
Big Sky Telegraph	(406)683-7680	Educational Plans/Services to Rural Montanna Schools	Montanna Rural Education Network	Dillon ,MT
Boston Citinet	(617)439-5699	City of Boston Information Service - Advertising Supported	Advanced Videotext Systems	Boston ,MA
Brown Bag Software BBS	(408)371-7654	Power Menu/ PC Outline Software Support	Brown Bag Software	Campbell ,CA
ButtonWare BBS	(206)454-2629	PC-File dB / PC-Calc / PC-Type Software Support	Jim Button/ButtonWare	Bellevue ,WA
C.A.R.L. Library Service	(303)830-1165	Citations to 2 Million Texts in Colorado Library System FREE	Colorado Alliance of Research Libraries	Denver ,CO
Canada Remote Systems	(416)232-0442	Probably Canada's largest BBS/Online Information Service	Jud Newell	Toronto ,Ontario
CatHouse BBS 206/2901	(805)395-0650	Multiline Support System for Wildcat BBS Software	Mustang Software	Bakersfield ,CA
Cathouse II SuperSystem	(513)528-0505	TV Satellite Dish Info - Videocypher Descrambler Info	Seed City Engineering	Cincinnati ,OH
Census Bureau Office Automation	(301)763-4576	Microcomputers and Office Automation	US Dept. of Commerce/Nevins Frankel	Suitland ,MD
Census Bureau Personnel Division	(301)763-4574	Employment Opportunities Within the Census Bureau	US Dept. of Commerce/Nevins Frankel	Suitland ,MD
Channel 1	(617)354-5776	Twenty-line New England PCBoard System	Brian Miller/Tess Heder	Cambridge ,MA
Classi Computer Fieds	(317)359-5199	Online System for Classified Advertisements	Steve Edsall/Trader Newspaper	Indiannapolis ,IN
Clean Air BBS	(408)298-4277	Environmental Health/Cigarette Smoking Topics	American Lung Association/ Sheila Blash	San Jose ,CA
Cleveland Freenet	(216)368-3888	Cleveland City Information/Ohio Governor's Office Online	Case Western University/AT&T/Ohio Bell	Cleveland ,OH
Computer Business Services	(714)396-0014	Computer Columnist John C. Dvorak's office BBS	John C. Dvorak and Nick Anis Jr.	Diamond Bar ,CA
Computing Canada Online	(416)497-5263	Adjunct to Excellent Canadian PC Newspaper	Computing Canada Newspaper	Willowdale ,Ontario
Dante Project BBS	(603)643-6310	Commentary/Research on Dante's Divinia Comedia	Dartmouth College	Hanover ,NH
DataLink RBBS System	(214)394-7438	Weather Satellite Imaging, NOAA Satellite Tracking	Dallas Remote Imaging Group/Jeff Wallach	Carrollton ,TX
Economic Bulletin Board	(202)377-0433	Economic Statistics/GNP/CPI/Employment, Trade Opportunities	US Department of Commerce	Springfield ,VA
ELISA II	(202)697-3632	Export License Status Advisor - Technology Export Issues	Defense Technology Security Admin.	Washington ,D.C.
Energy Info Admin E-Publications	(202)586-8658	Variety of Petroleum/Coal/Electricity Energy Statistics	US Department of Energy	Washington ,D.C.
Event Horizons	(503)777-1578	Digitized Graphics Image Library	Jim Maxey	Portland ,OR
EXEC-PC	(414)964-5160	Largest BBS in US - 90 Lines - 70,000 files - 4 Gigabytes	Bob Mahoney	Shorewood ,WI
Family Radio Forum Headquarters	(415)562-5483	Center for Nationwide Network of Family/Christian BBS		Oakland ,CA
Far West BBS	(604)381-4430	Large Western Canada Galacticomm Info System	Ren L'Ecuyer	Victoria ,BC
FCC Public Access Link	(301)725-1072	Equipment Authorization Status Advisory Service	Federal Communications Commission	Columbia ,MD
Federal Deposit Insurance Corp.	(202)737-7264	General Microcomputer Information	R. Campbell and L. Rudolph	Washington ,D.C.
Federal Job Information Center	(313)226-4423	Federal Job Opportunity Lists available online	US Office of Personnel Management	Detroit ,MI
FEDLINK ALIX	(202)287-9656	Info on Federal Libraries -Excerpts Library of Congress News	Federal Library Information Network	Washington ,D.C.
FOG City BBS 125/10	(415)863-9697	Gay Community BBS - AIDS Info - Desktop Publishing - MACs	Bill Essex	San Francisco ,CA
Forbin Project, The	(319)233-6157	Home of QModem SST Communications Software	John Friel III	Cedar Falls ,IA
GAO Bulletin Board	(202)275-1050	Lotus/dBase/Word Perfect User Tips	US General Accounting Office/Sheryl Lee	Washington ,D.C.
GLIB	(703)578-4542	Gay and Lesbian Information Bureau - 11 Lines - 9600 bps	Community Educational Svcs. Foundation	Arlington ,VA
Greenpeace Environet	(415)861-6503	Ecological and Peace Issues - Disarmament/Toxics/Wildlife	Dick Dillman/Greenpeace	Washington ,D.C.
GT PowerComm BBS	(713)772-2090	Home of GT Power Communications Software	Paul Meiners/P&M Software	Houston ,TX

BBS Name	Phone	Description	Organization/Contact	City, State
Hay Locator	(317)494-6643	Database of Hay/Straw Suppliers and Buyers	Purdue Univ. Agricultural Computer Net	,
Hayes Advanced Systems Support	(800)IJS-HAYES	Eight Line Hayes Modem Support BBS	Hayes Microcomputer Products	Norcross ,GA
Herpnet/Satronics TBBS	(215)698-1905	Reptile and Amphibian Studies - Poison Snakes/Toads/Fish	Mark Miller	Philadelphia ,PA
IBM Users Group Support BBS	(404)988-2790	IBM PC User Groups Database - Newsletter Exchange	IBM National Support Center	Atlanta ,GA
Info-Source Canada	(416)574-1313	Online publications	Eric Feistmantl	Hamilton ,Ontario
Information Resources Services	(202)535-7661	Fed Micro Procurement Rpts. - List of Banned Contractors	General Services Administration	Washington ,D.C.
Intel Support BBS	(503)645-6275	Support for Intel PC Products - Inboard 386/AboveBoard 286	Intel Corporation PCEO Division	Hillsborough ,OR
Investor's Online Data	(206)285-5359	Online Investment/Stock Market Information/Tech Analysis	Don Shepherdson	Bellevue ,WA
IRS Tax Practitioner BBS	(208)334-1763	Income Tax Information - Questions Answered in 48 Hours	Internal Revenue Service - Boise Office	Boise ,ID
JAG-NET	(202)325-0748	Navy Judge Advocate General's Information Network	US. Dept. of Navy / Chris Buechler	Arlington ,VA
JOBBS	(404)992-8937	Online Job Listings - 2186 Technical Pos. - 10,000 Corps.	Alpha Systems Inc./Bill Griffin	Roswell ,GA
Lasergems Computer Hotline	(602)867-7258	Mail Order Laser Salvage/Supply - Laser Eavesdropping Device	Meredith Instrument Company	Glendale ,AZ
LUMINA	(612)626-2206	Libraries of Univ.of Minnesota Integrated Net Access7E1VT100	University of Minnesota	Twin Cities ,MN
MCI Consultants Support BBS	(800)873-5548	Long Distance Rates/Technical Advice for Comm Consultants	Curtis Abrue/MCI Telecommunications Inc.	,
MEDCOM BBS Club	(800)445-4227	80 nodes - Games - Chat Lines - News Services	MEDCOMM Information Systems	Anaheim Hills ,CA
Micro Message Service	(919)779-6674	USA Today/Newsbytes/Boxoffice Magazines - 400+MB Downloads	Mike Stroud	Raleigh ,NC
Microrim Technical Support BBS	(206)881-8119	Support for Popular R:Base Relational Data Base System	Microrim Corporation	Redmond ,WA
NANci BBS	(202)475-1973	Online Version of Naval Aviation News Magazine	Naval Aviation News/Cmdr. John Norton	Washington ,D.C.
NARDAC BBS	(804)445-1627	Zenith Computer Support - List of Federal Micro User Groups	Navy Regional Data Automation Center	NAS Norfolk ,VA
NASA Spacelink	(205)895-0028	NASA Educational Affairs Div. - Flight Data/Space History	Marshall Space Flight Center	Huntsville ,AL
National Agricultural Library	(301)344-8510	Agricultural Info/Research Resources	US Department of Agriculture	Beltsville ,MD
National E-Mail Registry	(800)622-0505	Register Your E-Mail Addresses Online - No Charge	National E-Mail Registry	Trevose ,PA
National Genealogical BBS	(703)528-2612	Family History - Genealogical Research - Gravestone Haunting	National Genealogical Society	Arlington ,VA
National Inst.Science Technology	(301)948-5717	Micro Elect.Info Exchange - Virus Protection/Security Issues	National Inst. of Science and Technology	Gaithersburg ,MD
National Publishers Exchange	(813)989-1087	Headquarters for NPE Newsletter - Desktop Publishing	Ed Aborn	Tampa ,FL
NAVWESA	(202)433-6639	Naval Weapons Engineering Support	Dept. of Navy / Bill Walsh	Washinton, D.C. ..
New York Macintosh Users'Group	(212)932-9513	Macintosh Downloads - MAC Street Journal/Newsletter	Darryl Peck/New York Mac Users' Group	New York ,NY
NIST ACTS	(303)494-4775	Automated Computer Telephone Service - Sync PC to NBS Time	Nat. Institute for Standards/Technology	Boulder ,CO
NOAA Information Technology Exch	(301)770-0069	Microcomputer Applications and Recommendations	National Oceanographic/Atmospheric Admin	Rockville ,MD
NOAA Solar	(303)497-5000	Solar Flare/Geomagnetic Data Online	National Oceanographic/Atmospheric Admin	Boulder ,CO
North Dakota State University	(701)237-8661	University BBS - Enter Class 20	University of North Dakota/Pete Lambertz	Fargo ,ND
Northrop Career Access	(213)938-5532	Northrop Aerospace Employment Opportunities - 7N2	Northrop Corp B2 Division	Pico Rivera ,CA
NYCENET BBS	(212)769-0550	New York City Education Network	New York City Board of Education	New York ,NY
OCRWM Infolink	(202)586-9359	Radioactive Waste Disposal/Hazardous Materials Handling	Office of Civilian Radiation/Waste Mgmt.	Washington ,D.C.
OERI BBS	(800)222-4922	Educational Statistics and Data - Perfomance Stats -	US Department of Education	Washington ,D.C.
Online Store DLX	(805)656-0379	Online Catalog of PC Hardware/Peripherals - Online Mailorder	Stan Snyder/Online Store	Ventura ,CA
Osprey's Nest	(301)989-9036	Birdwatching, Bird feeding, Naturalist/Ecology Issues	Fran and Norm Saunders	Colesville ,MD
Photo*Life	(301)270-2638	Nature Photography	Michael Havelin	Takoma Park ,MD
PHYSICS Forum BBS	(413)545-1959	Physics and Astronomical Sciences	Univ.of Mass. Dept. of Physics/Astronomy	Amherst ,MA
PKWare BBS	(414)352-7176	Home of PKARC and PKZIP File Compression Utilities	Phil Katz/PKWare Incorporated	Glendale ,WI
Popular Mechanics Online BBS	(212)582-8369	Automotive, Home/Shop, Electronics/Photography, Science	Popular Mechanics Magazine	New York ,NY
ProComm Support BBS	(314)474-8477	Home of ProComm 2.4.2 and ProComm Plus Comm Prgrms	Thomas Smith/DataStorm Technologies Inc.	Columbia ,MO
Public Brand Software BBS	(317)856-2087	Commercial Shareware Vendor	Public Brand Software	Indianapolis ,IN
Publishers Information Svce.	(312)342-6919	Xerox Ventura Publisher Support/Laser Printing/Scanning	George Weiners	Chicago ,IL
Radio Electronics BBS	(516)293-2283	Radio Electronics Magazine Online Adjunct	Gernsback Publications	Farmingdale ,NY
Random Access Information Svc.	(503)761-8100	10500 IBM/MAC/AMIGA Files - 3000 MaxiPic Graphics	Janice Stevens	Portland ,OR
Rocky Mountain High	(719)632-2658	Political Discussions - Unix UUCP Public Access - Multiline	Dave Hughes	Colorado Springs ,CO
Rose Media	(416)733-2780	Excellent Canadian PC Board System-Publications/Conferences	Vic Kass	Willowdale ,Ontario
SALEMDUG BBS	(202)646-2887	Hazardous Materials/National Damn Watch/Emergency Info	Federal Emergency Management Agency	Washington ,D.C.

BOARDWATCH MAGAZINE

NATIONAL LIST OF ELECTRONIC BULLETIN BOARD SYSTEMS AND ON-LINE INFORMATION SERVICES - NOVEMBER 1989

SERVICE	PHONE	DESCRIPTION	SPONSOR/SYSOP	LOCATION
Scenix Network	(213)372-2282	USA Today - BoxOffice Magazine - Local Real Estate	Connie Trantham/Steve Campbell	Manhattan Beach ,CA
Science Resource Studies BBS	(202)634-1764	Federal R&D Budget - Technical Labor Market Statistics	National Science Foundation	Washington ,D.C.
SEAboard!	(201)473-1991	Support system for ARC, SEADOG, and AXE software.	System Enhancement Associates	Wayne ,NJ
Second Ring, The	(203)268-5315	Home of RBBS Software	Tom Mack	Trunbull ,CT
Silicon Valley Information Ctr.	(408)277-5758	Online Computer Magazine Index - Logon PUBLIC	San Jose Public Library	San Jose ,CA
Society for Technical Comm. BBS	(202)393-3557	STC Job Service, Freelance Registry - Technical Writers	Society for Technical Communication	Washington ,D.C.
Software Plus BBS	(919)577-9831	Online Publications - Shareware Downloads - 500 MB	Tim Crawford/Software Plus Computers	Jacksonville ,NC
Synergy	(617)769-5468	Turbo Basic/Turbo C/Quick C/Turbo Pascal/Assembly Language	Gerry Powers/Jim Boxmeyer	Norwood ,MA
Take 3 BBS	(602)482-1001	Reviews of Movies/Videos/ Film Industry Job Clearinghouse	Dave Kidder	Scottsdale ,AZ
Talk Channel	(818)506-0620	DLX-Based Multiline Chat/Talk Service - Sexual Orientation	Gary Clarkson	North Hollywood ,CA
TAXACOM	(716)896-7581	Botany, Herbaria, FLORA ONLINE Newsletter, Latin Translation	Clinton Herbarium, Buffalo Museum	Buffalo ,NY
Taxonomic Reference File	(215)972-6759	Online Bacterial Name Database - ORACLE Door	BIOSIS Carol Lock/Keith Pittman	Philadelphia ,PA
TBBS Net 104/23	(303)699-9248	Home of The Bread Board System (TBBS) BBS Software	Phil Becker/eSoft Inc.	Aurora ,CO
Telecommunications Relay Station	(501)442-8777	Online Publications - Excellent TBBS System	Gary Funk	Fayetteville ,AR
Telegodzilla	(503)621-3746	Home of ZModem File Transfer Protocol/YModem/YAM	Chuck Forsberg/Omen Technology Incorp.	Portland ,OR
Telix Support BBS	(416)284-0682	Support Service for Telix Communications Software	Colin Sampaleanu/Exis Incorporated	West Hill ,Ontario
Texas State Law Library BBS	(512)463-1371	Online Legal Periodicals and Citation Database		San Antonio ,TX
The Ledge PCBoard	(818)352-3620	Home of Textview Door for PCBoard Systems	Joseph Sheppard	Tujunga ,CA
The LiveWire BBS	(609)235-5297	Online Magazine Subscription Orders	Richard Paquette	Mt. Laurel ,NJ
The Other Ball	(818)358-6968	Adult Multiline Chat System - Games - Magazines - Downloads	Michael Allen	Monrovia ,CA
The Unique and Nifty BBS	(317)866-0725	Computer Graphics, Animation, and Sound Files	Tim McCormick and John Everman	Crawfordsville ,IN
The Village Inn	(212)924-6899	Greenwich Village PC Board System - Networked Message Areas	Chris Welber	New York ,NY
The Well	(415)332-6106	Very Popular Big BBS - Hourly Charges	Whole Earth Lectronic Link	Sausalito ,CA
Thomas Business Systems	(407)395-7057	Used Computer/Peripheral Price List Online Database	Phil Thomas/Thomas Business Systems	Boca Raton ,FL
TOPS Support BBS	(415)769-8874	Application Notes, Product Descriptions for TOPS LAN	Sun MicroSystems	Alameda ,CA
United Nations BBS	(201)795-0733	UN Press Releases - Unitex News - Unicef	Dr. James Waldron	Hoboken ,NJ
US Naval Observatory BBS	(202)653-1079	Time - Date - Sunrise - Sunset - Enter @TCO for Commands	US Department of Commerce US Naval Obser	Washington ,D.C.
US Robotics - Sit UBU Sit	(312)982-5092	Support for US Robotics HST 9600 bps Modems	US Robotics Corporation	Skokie ,IL
USA Today Distribution Service	(303)973-4222	Distribution Service for USA Today/Newsbytes/Boardwatch	Boardwatch Magazine	Littleton ,CO
USGS Quick Epicenter Determin.	(800)358-2663	Earthquake Epicenter Data - Geomagnetism7E2	US Geological Survey Earthquake Info Cnt	Denver ,CO
USNO Time of Day for Clocks	(202)653-0351	Xmits ASCII Time String - Sync Your PC to USNO Atomic Clock	US Dept. of Commerce US Naval Observ.	Washington ,D.C.
UT Library Online Catalog	(512)471-9420	Online Library Card Catalog Listing 3.5 million entries	University of Texas a: Austin	Austin ,TX
VA Property Listing BBS	(602)241-2371	List of VA held property foreclosures	Veterans Admin - Phoenix Regional Office	Phoenix ,AZ
Vacation Florida Database	(407)839-0333	Florida Tourism Information/Database of Campsites/Hotels	Richard and Barbara Kenney	Orlando ,FL
Vancouver ED-NET	(604)734-3282	Educational Online Service	Vancouver Board of Education	Vancouver ,BC
Ward and Randy's CBBS	(312)545-8086	World's First and Oldest Micro-based BBS - Since 2/16/78	Ward Christensen/Randy Suess	Chicago ,IL
WeatherBank	(800)827-2727	Online Weather Forecasts for Any City - Download Radar Data	Steve Root/WeatherBrief Data Services	Salt Lake City ,UT
WeatherStar Pilot Briefing	(612)296-5426	Pilot Data, Weather, Great Circle Route, Airport Information	Haynes Environmental Systems	Minneapolis ,MN
Western Digital Tech Support	(714)756-8176	Hard Drive/Controller Installation and Config Data	Western Digital Corporation	
XyQuest Support BBS	(508)667-5669	Support for XyWrite Word Processor - Custom Keyboard Files	XyQuest Inc. - Christine Madsen	Bellerica ,MA
Ye Olde Bailey	(713)520-1569	Legal Issues Regarding RBOC Relations with Info Services	Reginald Hirsch; Attorney	Houston ,TX

DENVER PC BOARDWATCH

LIST OF 137 AREA CODE 303 ELECTRONIC BULLETIN BOARD SYSTEMS AND ON-LINE INFORMATION SERVICES - NOVEMBER 1989

TITLE	PHONE	DESCRIPTION	TYPE	MODEM	SOFT	CITY	OPERATOR
Adelante 104/93	443-8292	Central/Latin America News/Issues	IBM	2400	Opus	Boulder	Zhahai Stewart
Adventures Unlimited 306/156	1-223-4534	Online Games - Chess - Tradewars - More	IBM	2400	QuickBBS	Fort Collins	Ray Randolph
Alpha BBS/Intercomex	375-8231	Enter ALPHA - Ham Radio/Space Topics	Unix Mini	1200	UNaXcess	Denver	Cyro Lord/Robert Brumley
AmNet On-line 306/12	1-223-1297	Animal Rights Issues/Animal Rights Echo	IBM	2400	TBBS	Ft. Collins	James Cherry
APSNet	693-6737	Aurora Public Schools Network	Apple	2400	GBBS	Aurora	Columbia Middle School
Arkham Public Library 104/48	494-7970	Children's Games	IBM	2400	Opus	Boulder	Neil Beaty
Arvada 68K BBS	469-9862	Amiga/Macintosh/Atari ST/Motorola 68000	Amiga	2400	BBS-PC	Denver	Reid Bishop
Boardwatch Magazine 104/555	973-4222	Back Issue Index, Dialing Directories	IBM	2400	TBBS	Littleton	Jack Rickard
Boulder Amiga Users Group	494-4470	Amiga Support - Over 1000 Amiga Files	IBM	2400	QuickBBS	Boulder	Ken Fricklas
Byte Shop 104/311	794-5065	Jokes/Good Echomail/Downloads	IBM	96HST	QuickBBS	Littleton	Dan O'neal
C.A.C.H.E	745-4960	CO Apple & Compatible Home Enthusiasts	Apple	2400	GBBS	Denver	Gary Edwards
C.A.R.L. Denver	830-0519	Colorado Alliance of Research Libraries	Tandem	2400	Custom	Denver	N/A
C.A.R.L. Denver	830-1165	Colorado Alliance of Research Libraries	Tandem	2400	Custom	Denver	N/A
C.A.R.L. Denver	830-1546	Colorado Alliance of Research Libraries	Tandem	1200	Custom	Denver	N/A
C.A.R.L. Denver	830-2199	Colorado Alliance of Research Libraries	Tandem	2400	Custom	Denver	N/A
C.A.R.L. Denver	830-2241	Colorado Alliance of Research Libraries	Tandem	2400	Custom	Denver	N/A
C.A.R.L. Denver	830-2265	Colorado Alliance of Research Libraries	Tandem	2400	Custom	Denver	N/A
C.A.R.L. Denver	830-2297	Colorado Alliance of Research Libraries	Tandem	2400	Custom	Denver	N/A
C.D. Players	825-0419	Computer Discount On-line Store/Amiga	Amiga	2400	TBBS	Denver	Jay Tompkins
CAI Denver 104/425	759-0410	Computer Access Support BBS	IBM	96HST	QuickBBS	Denver	John Denny
CBA Information System	329-0159	Continental Basketball Association	IBM	1200	TBBS	Denver	???
CEC Services	393-6715	ANSI True Basic Support Tools	IBM	1200	QuickBBS	Denver	???
Champagne Alley	220-5708	Financial Info - Free Exchange of Info	IBM	2400	RBBS	Denver	Patrick Hinde
Chatfield Armory	972-9023	Firearms for Sale/Trade - Online Games	IBM	2400	QuickBBS	Littleton	Dave Bell
Chidvilas 104/207	449-7399	Bhagwan Shree Rajneesh followers	IBM	96PEP	Opus	Louisville	Terry Mooster
Club Micro/Compumatch 104/88	973-8578	Adult Meeting Place/Shareware Downloads	IBM	96HST	TBBS	Littleton	Don Marquart
CMOS-CO Mtn Operating Systems	322-4078	Amiga/IBM-Utilities-Pictures-Buy/Sell	IBM	96MICROC	QuickBBS	Denver	Kevin Truitt
CO State Judicial BBS 104/420	831-1704	Colorado State Judicial ADP Department	IBM	2400	QuickBBS	Denver	Scott V. Hopta
Colorado West BBS	1-241-1966	Grand Junction MUG - Ham/Packet Radio	IBM	96Hayes	PCBoard	Grand Junction	Wayne Hunt
Comm-Post, The 104/666	534-4646	Astronomy - 120+ MB of Files - Multiline	IBM	96HSTV32	TBBS	Denver	Brian Bartee
Computer Consulting 104/318	973-1002	dBase Database Software Developement	IBM	96Hayes	QuickBBS	Littleton	Jim Bucks
Computer Linkage 104/444	499-1022	Amiga/Atari/IBM/TI - Medical Information	IBM	2400	Opus	Boulder	Ron Kuseski
Control Systems 104/417	458-6248	IBM/Compatibles Subscription Board	IBM	96MICROC	RBBS	Denver	Lupe Ramirz
Cook, The 104/419	861-0814	Recipes/Cooking Theme 9P-7A	IBM	2400	QuickBBS	Denver	Richard Harper
CP/M SIG INC 104/372	465-1313	Oldest User's Group in Area - CP/M - IBM	IBM	2400	Fido	Broomfield	Al Lundquist
Crypt, The	696-9084	Twenty Online Games - Adult Messages	IBM	2400	WWIV	Denver	Bill Bonic
Cyber-Zone, The 104/61	429-2208	Science Fiction/USA Today	IBM	2400	QuickBBS	Denver	Jonathan Wood
D-Link 1 104/411	936-2791	Golden Micro Computer Sales/Support	IBM	96HST	QuickBBS	Denver	Bob Wells
D-Link III 104/413	935-3577	Down to Earth Level Headed BBS	IBM	2400	QuickBBS	Denver	Mark Haines
Dark Crystal, The 104/421	654-1278	Role Playing Games	IBM	2400	QuickBBS	Denver	Steve Boyd
Data Bank	494-0167	IBM Messages	IBM	2400	TCOMM		Guido Binetti
Denver Area R:BASE Users Group	422-2149	R:BASE Information PC Related Files	IBM	2400	QuickBBS	Lakewood	Paul Fullerton
Denver Deaf-Net	989-9245	Hearing Impaired/Computing	IBM	2400	QuickBBS	Lakewood	David Sheneman
Dinosaur Board 104/114	1-652-3595	TRS80 Support/V16 Online Adventure Games	IBM	96HSTV32	TBBS	Niwot	Chris Anderson

BBS Name	Phone	Description	Computer	Speed	Software	City	Sysop
Dinosaur Egg	680-5985	Graphics Interests	IBM	2400	QuickBBS	Denver	Mick Clark
Eagle's Nest 104/315	933-0701	Many Files and Echoes	IBM	9600	QuickBBS	Littleton	Ronald Olsen
Emerald City BBS 104/214	427-1471	Electronics Discount World	IBM	2400	QuickBBS	Westminster	Daniel Osbom
EMPLOY-NET	871-9504	Employment Info - Career Management	IBM	2400	QuickBBS	Denver	David Hakala
Enterprise	377-1005	Local Radio Freq List - Star Trek Theme	Apple	2400	Protree	Denver	Jeff Tensly
Equinet	369-0738	Equestrian/Horse Interests	IBM		TBBS	Aurora	Frank Maestas
eSoft TBBS Software Support	699-9248	The Bread Board System-LOGON-ANSI DEMO	IBM	96HST	TBBS	Aurora	Phil Becker
Fantasy Mtn D-Link IV 104/803	278-8369	Deaf and Handicapped Issues ASCII TTY	IBM	2400	QuickBBS	Golden	Steve Shockley
Flightstar Information Service	790-4356	Used Aircraft For Sale Database/Bluebook	IBM	2400	Custom	Englewood	Mickey Russell
Four Wheeling BBS, The	469-4954	Jeeping / Camping / Outdoors	Atari	2400	STadel	Broomfield	John Ferguson
Foxx Empire 306/16	1-484-4359	Online Simulation of Medieval Town	IBM	2400	QuickBBS	Fort Collins	Andrew Boardman
Fred's BBS	233-1316	Online Chess - Adult Areas	IBM	2400	QuickBBS	Lakewood	Fred Schupner
Free Information Exch. 104/89	699-1516	Programming - Home and Garden	IBM	2400	Opus	Denver	Charles Frnka
Free Thought BBS 104/423	695-0654	Objectivism/Libertarian Views	IBM	96HSTV32	QuickBBS	Aurora	Bill Williams
Front Range PC Users Group BBS	1-493-4094	Fort Collins Group - Computer Express	IBM	2400	Wildcat	Fort Collins	Tom Oppenheimer
FutureWave BBS 104/57	440-7425	Games / C Language / MIDI	IBM	2400	Opus	Boulder	Bruce Arnold
Galaxy Express 999 104/215	469-3221	Japanese Cartoon Animation-Messages	IBM	2400	QuickBBS	Broomfield	Witheld by Request
Gay Community Fido 104/19	795-1215	Messages / Downloads for Homosexuals	IBM	1200	QuickBBS	Littleton	Tom Gettys
GDP Technologies BBS	673-9470	Outstanding IBM Shareware/Programming	IBM	2400	Wildcat	Lafayette	Vincent Veritas
Grotto, The	694-9050	Amiga, Pascal - Ebert Personal Computers	IBM	2400	TBBS	Aurora	Mark Willecke
HP Haven 104/312	671-5976	Tradewars/On-line Games/ 5PM-7:30 AM	IBM	2400	QuickBBS	Westminster	Rob Diehl
HP-BBS 306/10	1-229-9719	Jokes, Amazing but True stories,	IBM	9600	TBBS	Fort Collins	Ron Dries
JEFFCCIM BBS	273-6951	Jefferson County Public Schools	IBM	1200	RBBS	Golden	John Anderson
KDKO Radio 104/64	293-8462	Broadcasting Theme	IBM	2400	TBBS	Littleton	Jim Burt
King's Market Bookshop 104/115	665-6091	Books, Writers, On-line Adventure Games	IBM	2400	TBBS	Boulder	Ralph Allison
Kings Bench 104/615	377-6725	Compatible Computer Info Exchange	IBM	2400	Fido	Denver	Lance Taylor-Warren
L&L Support	420-3568	Primary GBBS Pro Software Support BBS	Apple	2400	GBBS	Arvada	Larry Scheideman
Lakewood Department of Safety	987-7388	Police Sponsored - Law Enforcement Msgs	IBM	1200	RBBS	Wheatridge	Bill Wright
LaserWriting Desktop Service	741-4122	Laser Printing/Scanning/Linotronic 300	MAC	1200	RedRyder	Denver	Don Bell
LDS Reading Room, The 104/513	343-1665	Latter Day Saints - The Mormons	IBM	2400	QuickBBS	Aurora	Greg Bradt
Lensman, The	979-8953	Science Fiction/Fantasy Fandom News/Info	IBM	2400	GT Power	Littleton	George Willett
LES-COM-net	526-2046	Lesley College Comm Net - GBBS Multiline	Apple	2400	GBBS	Genesee	Harold "Monty" Montrose
Lodge, The 104/212	420-0305	Arvada Quick BBS Board	IBM	2400	QuickBBS	Arvada	Ken Zen
MACE 104/416	797-8090	Metro Area Computer Enthusiasts	IBM	1200	QuickBBS	Denver	Kirk Stevens
Metronet BBS	985-4652	Business Network - $25 for six months	IBM	2400	TBBS	Lakewood	Girard Westerberg
Microlink B 104/108	972-9600	1 Gigabyte Files - USA Today - Multiline	IBM	96HSTV32	TBBS	Littleton	???
Microlink D 104/711	237-8575	Over 200 MB - Doesn't Break	IBM	96HST	TBBS	Lakewood	Paul Smith
Microlink Minus Two 104/204	753-9710	Professional Comp. Sales Inc./Astronomy	IBM	2400	TBBS	Denver	Daniel Segard
Midrash 104/18	289-6864	Messianic Judaism - Religious/Philosophy	IBM	2400	QuickBBS	Denver	Bill Ankela
Mile High BBS	733-1340	Triathalons - Race Schedules - Fitness	IBM	2400	RBBS	Denver	Jon Taylor
Mile High Mac Meet	758-9159	Denver Macintosh Users Group	MAC	96HST	WWIV	Denver	Dave Miller
Mile High Net	671-7308	Fido Board	IBM	2400	Fido	Aurora	Michael Mckizzic
MLM International Networks	933-2654	Online Mall - TANDY Computers - MCI Tel.	MAC	1200	MouseEx	Littleton	Claude Warren
Mohave Net Gateway 104/62	425-0623	Science Fiction/Medical Echo	IBM	96HST	QuickBBS	Denver	
NBS Automated Computer Time	494-4775	ACTS - Sync PC Clock to NBS Atomic Clock	Custom	1200	Custom	Boulder	Natl. Bureau of Standards
NetComm BBS	790-8349	Weather - Online Games - 110 MB	IBM	2400	GT Power	Littleton	Bill Watts
New Age Bulletin Board, The	366-1106	Health, Ecology, Philosophy	IBM	1200	TBBS	Aurora	Hal/Fran Piser
NightFlyer 104/210	467-9199	Basic/dBase/Assembler/C Programming	IBM	2400	QuickBBS	Arvada	Marcel Madonna
Ninth Portal, The	690-5001	SciFi/Fantasy Starship Exploration Game	Amiga	2400	Atredes		Rick Henderson
Nurse Link 104/52	270-4936	UCHSC School of Nursing	IBM	2400	TBBS	Littleton	Larry McNeill

DENVER PC BOARDWATCH

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TITLE	PHONE	DESCRIPTION	TYPE	MODEM	SOFT	CITY	OPERATOR
OKY BBS 104/113	494-0533	Armenian Electronics Consultant	IBM	2400	QuickBBS	Boulder	Onnig Kouyoumdjian
On-Line Consulting 104/45	449-5251	Consultant Directory/Desktop Publishing	IBM	2400	Opus	Estes Park	Lee Lasson
On-Line Shopping Service	442-5125	Boulder Home Grocery Delivery $5 + 5%	IBM	1200	Chairman	Boulder	Pete Dempsey
P2B2 S 104/51	329-3337	Public Psychiatry / AI Themes 6PM-8AM	IBM	2400	QuickBBS	Denver	Claude Warren
Paranet Omega 104/422	431-1343	Paranormal/Religion/UFO/Oddities	IBM	96HST	QuickBBS	Wheatridge	Mark Owens/Mike Corbin
POIS 104/904	789-4610	PC Info Services - List of User Groups	IBM	2400	Opus	Englewood	Phil Kaiser
Pentax Support	460-1637	CD WORM/Flatbed Scanner/Fanfold Laser	IBM	1200	TBBS	Broomfield	Chris Anderson
Phoenix TBBS 104/739	841-9570	Multiline - INFOMAT - Chat areas	IBM	96HST	TBBS	Parker	Larry Kayser
Pinecliffe 104/28	444-7073	170 Meg - Online Order for CDB Systems	IBM	96HST	Opus	Boulder	Craig Baker
Pink Flamingo 104/607	497-3934	Previously Fido NBS	IBM	2400	QuickBBS	Boulder	Cathy Nicolleti
Priority Business Sys. 104/41	771-8107	PC Magazine/Tech Journal Files	IBM	2400	Opus	Littleton	John Bilbro
Professional System, The	740-2223	Writers, Lawyers, EDP Auditors	IBM	1200	TBBS	Littleton	Bob Voorhees
Publishing Resources Inc.	442-2011	Laser Printing/Publishing/Linotronic	MAC	1200	RedRyder	Boulder	???
Quest, The	429-4617	Online Chess/Tradewars/Empire/Trivia	IBM	2400	QuickBBS	Denver	???
Quick BBS Support Board 104/24	423-3114	Home of Quick BBS Software	IBM	2400	QuickBBS	Arvada	Adam Hudson
Quick Epicenter Determination	279-6374	USGS Earthquake Data 7E2	VAX	300 7E2	???	???	Bruce Presgrave
R.A.B.B.I.T.	757-9509	Colorado Highway Department - Planning	IBM	1200	TBBS	Denver	Colorado Dept. Highways
Reading Room, The 104/513	690-5410	6PM - 6AM Ringback System during day	IBM	2400	RBBS	Aurora	Don Bell
Ready Room, The 104/424	329-8136	Star Trek Theme - USS Tutakai NCC-1799-B	IBM	2400	QuickBBS	Denver	Jason Steck
Realtime Control & Forth Board	278-0364	Vesta Technology/Denver Forth Int. Group	IBM	2400	PCBoard	Wheatridge	Jack Woehr
Regency Datasource 104/58	972-1222	Private Computer Consulting Support	IBM	96Hayes	Opus	Littleton	Charlie Bass
RiBBS Support Hdqrtrs. 104/54	343-6707	Support for CoCo RiBBS Software	IBM	2400	QuickBBS	Aurora	Ron Bihler
Rocky Mountain RBBS	750-2107	INFO NEEDED	IBM	1200	RBBS	Aurora	Steve Kornreich
Ron and Shannons BBS	978-0298	Atari Support 5.4 MB XE 130	Atari	2400	OASIS	Englewood	Ron/Shannon Sellers
Short Line 104/36	778-7312	Varied Topics, Fidonet, BinkleyTerm	IBM	2400	Opus	Lakewood	Alan Applegate
SnarfQuest V 104/317	973-0625	The Tower	IBM	2400	QuickBBS	Littleton	Radford Walker
SnarfQuest][[104/46	761-1634	The Arena On-line Games, Fantasy, AD&D	IBM	96HST	QuickBBS	Englewood	Dax Davis
Sound Doctrine BBS 104/514	680-7209	Christian BBS / Sound Doctrine Church	IBM	2400	TBBS	Aurora	Tim Williams
Space Environment Service Cntr	497-5000	NOAA Solar Flare Forecast / Advisory	IBM	1200	PBBS	Boulder	US Dept of Commerce
Space Network	494-8446	Space Exploration Information	IBM	2400	TBBS	Boulder	Tom Meyer
Steamboat Information	1-879-6741	Info on Steamboat Springs Area	IBM	1200	TBBS	Steamboat Springs	???
Stone Wall 104/112	499-2676	Online Games/Graphics 120 MB	IBM	96HST	QuickBBS	Boulder	Mike Reetz
Summit TBBS 104/47	1-468-2749	Colorado Ski Information	IBM	96HST	TBBS	Dillon	Lawrence Kehl
TBBS Net 104/23	699-9248	The Bread Board System Support	IBM	2400	TBBS	Aurora	Phil Becker/eSoft Inc.
Terus Public BBS 104/43	469-7161	MINDS AI TextBase Indexer Support	IBM	96HST	Opus	Broomfield	Todd Hill
The 8th Sea 104/610	252-9235	Fidonet 104 Net Coordinator	IBM	2400	QuickBBS	Northglenn	Rod Lamping
Translations Unlimited	988-5765	Language Translation 6PM-6AM	IBM	2400	Minihost	Lakewood	Jon Johnson
Vet Set, The	690-3218	Veterans Issues - Colorado Lottery Data	IBM	2400	RyanBBS	Aurora	Alfred Petersen
Watchdesk, The 104/66	450-0822	Safety - Arson - Hazardous Material	IBM	96HST	QuickBBS	Thornton	Emit Hurdelbrink
Weyr, The 104/211	429-2975	Good Collection of Game Software	IBM	96HST	Opus	Westminster	Ken Shimko
Wizardry 104/630	670-1416	Fantastic Online Blackjack/Casino Games	IBM	95HST	QuickBBS	Evergreen	Marvin Cook
World Peace BBS 104/415	320-4822	Current Events, Politics, Religion	IBM	2400	QuickBBS	Denver	Bucky Carr
YUCCA Mountain Project Group	236-9812	US Bureau of Reclamation - Dept of Int.	IBM	12-19200	PCBoard		Mark Pabst

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